Rocky Flats Environmental Technology Site

TYPE 1
RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)

CLOSURE PROJECT FOR BUILDINGS 990 AND 990A
(Includes 990 Aeration Tanks and Manhole)

REVISION 0

November 1, 2004

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

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REVISION 0

November 1, 2004

Reviewed by: _____ Date: 11/2/04
Don Risoli, Quality Assurance

Reviewed by: _____ Date: 11/2/04
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Cameron Freiboth, K-H D&D Project Manager

2

TABLE OF CONTENTS

ATTACHMENTS

3

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SAL	Soil Action Level
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds
WRW	Wildlife Refuge Worker

4

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the DPP (10/8/98) and compliant disposition and waste management of Buildings 990 (including aeration tanks and manhole) and 990A. Because these facilities were anticipated Type 1 facilities, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). All facility surfaces were characterized in this RLC, including the interior and exterior surfaces [i.e., floors (slabs), walls, ceilings, roofs and equipment]. Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

The RLC encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

Results indicate that no radiological contamination exists in excess of the PDSP unrestricted release limits of DOE Order 5400.5. All bulk sample results of building materials suspected of containing asbestos were negative or "None Detected". All beryllium sample results were less than 0.1 $\mu g/100cm^2$. Fluorescent light ballasts may contain PCBs. Any PCB ballasts and hazardous-waste items will be removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable. The residual sludge (approximately 160 cubic feet) remaining in the bottom of the two aeration basins will be removed prior to demolition, further characterized, and managed appropriately.

Based upon this RLCR, Buildings 990 (including aeration tanks and manhole) and 990A are considered Type 1 facilities. To ensure the facilities remain free of contamination and RLC data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) was performed to enable compliant disposition and waste management of Buildings 990 (including aeration tanks and manhole) and 990A. Because these facilities were anticipated Type 1 facilities, a PDS characterization was performed. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces of the facilities [i.e., floors (slabs), walls, ceilings, roofs and equipment]. Environmental media beneath and surrounding the facilities were not within the scope of this RLC Report (RLCR) and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed, among these are Buildings 990 (including aeration tanks and manhole) and 990A. The locations of these facilities are shown in Attachment A, *Facility Location Map.* These facilities no longer support the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before the facilities can be removed, a Pre-Demolition Survey (PDS) must be conducted; this document presents the PDS results. The RLC was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The RLC built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. An RLC is performed before Type 1 building demolition to define the pre-demolition radiological and chemical conditions of a facility. Pre-demolition conditions are compared with the release limits for radiological and non-radiological contaminants. RLC results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the pre-demolition radiological and chemical conditions of Buildings 990 (including aeration tanks and manhole) and 990A. Environmental media beneath and surrounding the facilities are not within the scope of this RLCR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this RLC were the same DQOs identified in the Pre-Demolition survey Plan for D&D Facilities (MAN-127-PDSP.) Refer to section 2.0 of MAN-127-PDSP for these DQOs.

6

2 HISTORICAL SITE ASSESSMENT

Facility-specific Historical Site Assessments (HSAs) were conducted to understand facility histories and related hazards. The assessments consisted of facility walk-downs, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). Results were used to identify data gaps and needs, and to develop radiological and chemical characterization packages. Results of the facility-specific HSA were documented in a facility-specific *Historical Site Assessment Report (HSAR) for the Area 5-Group 16 Facilities*, Dated December 2002, Revision 0. Refer to Attachment B, *Historical Site Assessment Report* for a copy of this HSAR. In summary, the HSAR identified the potential for radiological and chemical hazards, specifically, asbestos containing materials and RCRA/CERCLA concerns.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

An RLCR was previously submitted for Buildings 990 and 990A as part of the Area 5, Group 16 RLCR in September 2003. The Area 5, Group 16 RLCR was only partially concurred with by CDPHE. CDPHE RFCA Type 1 concurrence of Buildings 990 and 990A was not given in the Area 5, Group 16 RLCR because the Sanitary Treatment System was still in operation at the time of the RLC, thus some of the systems and surfaces were not completely available for characterization. The Sanitary Treatment System has since been shutdown and the previously inaccessible systems and surfaces have been adequately characterized; the recent results are contained within the attached RLCR.

Buildings 990 and 990A, and aeration basins have not been utilized since 1998, therefore there hasn't been any activity in these buildings since last years RLC that would comprise it's data. Since the initial surveys were performed of the buildings last year, KH has recently gone back into 990A and surveyed and scanned the previously inaccessible 990A trench (Location #26) and performed verification surveys on other areas within the buildings. The 990A trench was small and one survey point and scanning was adequate to characterize the trench.

In this re-submitted RLCR KH has also included the two aeration basins (including piping) and the manhole area as an additional survey unit (SU 990006). Since the aeration basins had a low potential for contamination they were classified as Class 3 areas. KH had labors enter the basins and clean out biased portions of the basin floors for surveys and sampling. The aeration socks coming off the air purge piping system was also surveyed as part of the new survey unit. These surveys were representative of the internals of the air purge piping system. The new survey unit results and the additional trench survey results are included in this re-submittal report. Additionally, a confirmatory removable radiological survey was performed of the inside and outside surfaces of Buildings 990 and 990A, confirming the survey results collected in the September 2003 RLCR had not changed.

7

Approximately two inches of residual sludge was present in the bottoms of the two aeration tanks. Two sludge samples from each aeration tank were collected and analyzed for radionuclides and the results were less than the RFCA Wildlife Refuge Worker Soil Action Levels (WRW SALs). However, since the RCRA metals analysis of the samples was above the WRW SALs, the residual sludge (approximately 160 cubic feet) will be removed from the aeration basins prior to demolition, further characterized, and then managed appropriately.

Buildings 990 (including aeration tanks and manhole) and 990A were characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files).

Three radiological survey unit packages were developed for the interior and exterior surfaces of the Buildings 990 (including aeration tanks and manhole) and 990A: 990004 (Building 990), 990005 (Building 990A) and 990006 (Building 990 aeration tanks and manhole). The survey packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, statistical analysis results, and survey locations are presented in Attachment C, *Radiological Data Summary and Survey Maps*. The radiological survey unit packages are maintained in the RISS Characterization Project files.

A total of seventy-two (72) TSA measurements (45 random, 11 biased, 10 equipment and 6 QC) and sixty-six (66) RSA measurements (45 random, 11 biased and 10 equipment); and a minimum of 5% of the interior and exterior surfaces of Buildings 990 (including aeration tanks and manhole) and 990A were scanned at biased locations. Except for Location #26, the data reported in this RLCR is the same data that was reported in the September 2003 RLCR. The TSA and RSA data values reported in the new RLCR are slightly different than the data values reported in the September 2003 RLCR due to rounding differences between the older Excel spreadsheet method and the newer Oracle database method of determining net activity.

The RLC data confirmed that these facilities do not contain radiological contamination above the surface contamination guidelines provided in the PDSP. Radiological survey data, statistical analysis results, sludge samples, confirmatory surveys, and survey locations are presented in Attachment C, *Radiological Data Summary and Survey Maps*. The radiological survey unit packages are maintained in the RISS Characterization

Project files. Level 2 Isolation Control postings are displayed on the buildings to ensure no radioactive materials are inadvertently introduced.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Buildings 990 (including aeration tanks and manhole) and 990A were characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facilities. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan (refer to RISS Characterization Project files) was developed during the planning phase that describes sampling requirements, the justification for the sample locations and estimated sample numbers. Contaminants of concern included asbestos, beryllium, RCRA/CERCLA constituents, metals and PCBs.

4.1 Asbestos

A visual survey of building materials suspected of containing asbestos was conducted in Buildings 990 (including aeration tanks and manhole) and 990A in accordance with the PDSP. A CDPHE-certified asbestos inspector conducted the inspection and sampling in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1.* Building materials suspected of containing asbestos were identified for sampling at the discretion of the inspector. No building materials suspected of containing asbestos were identified during the visual and tactile inspection of Building 990 and Building 990 aeration tanks and manhole, including the roofs. The tank and manhole are constructed of concrete and therefore, unlikely to contain any asbestos containing material. On this basis, asbestos sampling and analysis was not performed as part of the RLC in these areas. All laboratory results of bulk samples taken in Building 990A were "None Detected". Refer to Attachment D, *Chemical Data Summaries and Sample Maps*, for details on sample results and sample locations.

4.2 Beryllium (Be)

Based on the HSARs and personnel interviews, Buildings 990 (including aeration tanks and manhole) and 990A were anticipated Type 1 facilities. There was not, however, adequate historical and process knowledge to conclude that beryllium was not used or stored in these buildings. Therefore, biased beryllium sampling was performed in accordance with the PDSP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0, September 9, 1999.* Biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition. Due to the operational history, site location of the facilities and the very low potential for beryllium contamination, the beryllium samples collected inside Buildings 990 and 990A are representative of beryllium levels in Building 990 aeration tanks and manhole. The beryllium data reported in this RLCR is the same data that was reported in the September 2003 RLCR. All beryllium smear sample results were less than 0.1 $\mu g/100cm^2$. Beryllium laboratory sample data and location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps.*

9

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on a review of the HSAR, and facility walk-downs, Buildings 990 (including aeration tanks and manhole) and 990A are part of the RFETS sanitary waste treatment system and may have had small amounts of hazardous constituents pass through the system. Approximately two inches of residual sludge was present in the bottoms of the two aeration tanks. Two sludge samples from each aeration tank were collected and analyzed for total metals. Sample results showed levels of arsenic, chromium and lead above the RFCA Wildlife Refuge Worker Soil Action Levels (WRW SALs) in the residual sludge. Therefore, the residual sludge (approximately 160 cubic feet) will be removed from the aeration basins prior to demolition, further characterized, and then managed appropriately. Sludge laboratory sample data are contained in Attachment D, *Chemical Data Summaries and Sample Maps*. A sample location map for the sludge samples is not included, however Customer Numbers AA83-142A, AA83-142B, AA83-142C, and AA83-142D were collected in the north basin east end, north basin west end, south basin east end, and south basin west end, respectively.

Sampling for lead in paint in Building 990 (including aeration tanks and manhole) and 990A was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

The buildings may contain some RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, leaded glass and lead-acid batteries. These items will be removed prior to demolition and managed in accordance with the Colorado Hazardous Waste Act.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSARs, interviews and facility walk-downs of the Buildings 990 (including aeration tanks and manhole) and 990A, no PCB-containing equipment were ever present in the facilities, making the potential for PCB contamination resulting from spills highly unlikely. Therefore, PCB sampling was not performed in these facilities as part of this RLC.

Buildings 990 (including aeration tanks and manhole) and 990A were originally constructed prior to 1980. Therefore, paints used on the facilities are assumed to contain PCBs, and painted surfaces will be managed as PCB Bulk Product Waste. Some of the facilities may contain fluorescent light ballasts containing PCBs.

Fluorescent light fixtures will be inspected to identify PCB ballasts during removal operations. PCB ballasts will be identified based on factors such as labeling (e.g., PCB-containing and non PCB-containing), manufacturer, and date of manufacturing. All ballasts that do not indicate non PCB-containing are assumed to be PCB-containing and, if not leaking, or more than 9 pounds, will remain with the building and be disposed of as

10

PCB Bulk Product Waste. If non-leaking PCB ballasts are left in the building during demolition, the debris will be managed as PCB Bulk Product Waste.

5 PHYSICAL HAZARDS

Physical hazards associated with Buildings 990 (including aeration tanks and manhole) and 990A consist of those common to standard industrial environments and include hazards associated with energized systems, utilities, and trips and falls. There are no unique hazards associated with the facilities. However, care should be taken during demolition activities as Buildings 990 (including aeration tanks and manhole) and 990A are located near PAC 000-500 (Sanitary Sewer System-Active). The facilities have been relatively well maintained and are in good physical condition, and therefore, do not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for the decommissioning of Buildings 990 (including aeration tanks and manhole) and 990A, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◊ the *number* of samples and surveys;
- ◊ the *types* of samples and surveys;
- ◊ the sampling/survey process as implemented "in the field"; and,
- ◊ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Buildings 990 (including aeration tanks and manhole) and 990A will generate sanitary and PCB Bulk Product Waste. Estimated waste types and waste volumes are presented below by facility. There is no radioactive, asbestos or beryllium waste. Leaking PCB ballasts, and hazardous waste items will be removed prior to demolition and disposed of pursuant to Site waste management procedures.

Waste Volume Estimates and Material Types							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
990	400	0	100	0	0	0	None
990A	300	0	50	0	0	0	None
990 Aeration Tanks and Manhole	3,000	0	50	0	0	0	None

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Buildings 990 (including aeration tanks and manhole) and 990A are classified as RFCA Type 1 facilities pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and can be demolished. The Type 1 classification is based on a review of historical and process knowledge, and newly acquired RLC data.

The RLC of Buildings 990 (including aeration tanks and manhole) and 990A was performed in accordance with the DDCP and PDSP. All PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. These facilities do not contain radiological, asbestos or beryllium wastes. Any PCB ballasts or hazardous waste items will be managed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable.

The residual sludge (approximately 160 cubic feet) remaining in the bottom of the two aeration basins will be removed prior to demolition, further characterized, and managed appropriately. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. To ensure these Type 1 facilities remain free of contamination and RLC data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

12

9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA),* July 19, 1996.

DOE Order 5400.5, *"Radiation Protection of the Public and the Environment."*

EPA, 1994. *"The Data Quality Objective Process,"* EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 3, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual*, December 1997 (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure,* Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media,* Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey,* Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure,* Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.*

RFETS, *Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.*

RFCA Standard Operation Protocol for Recycling Concrete, September 28, 1999.

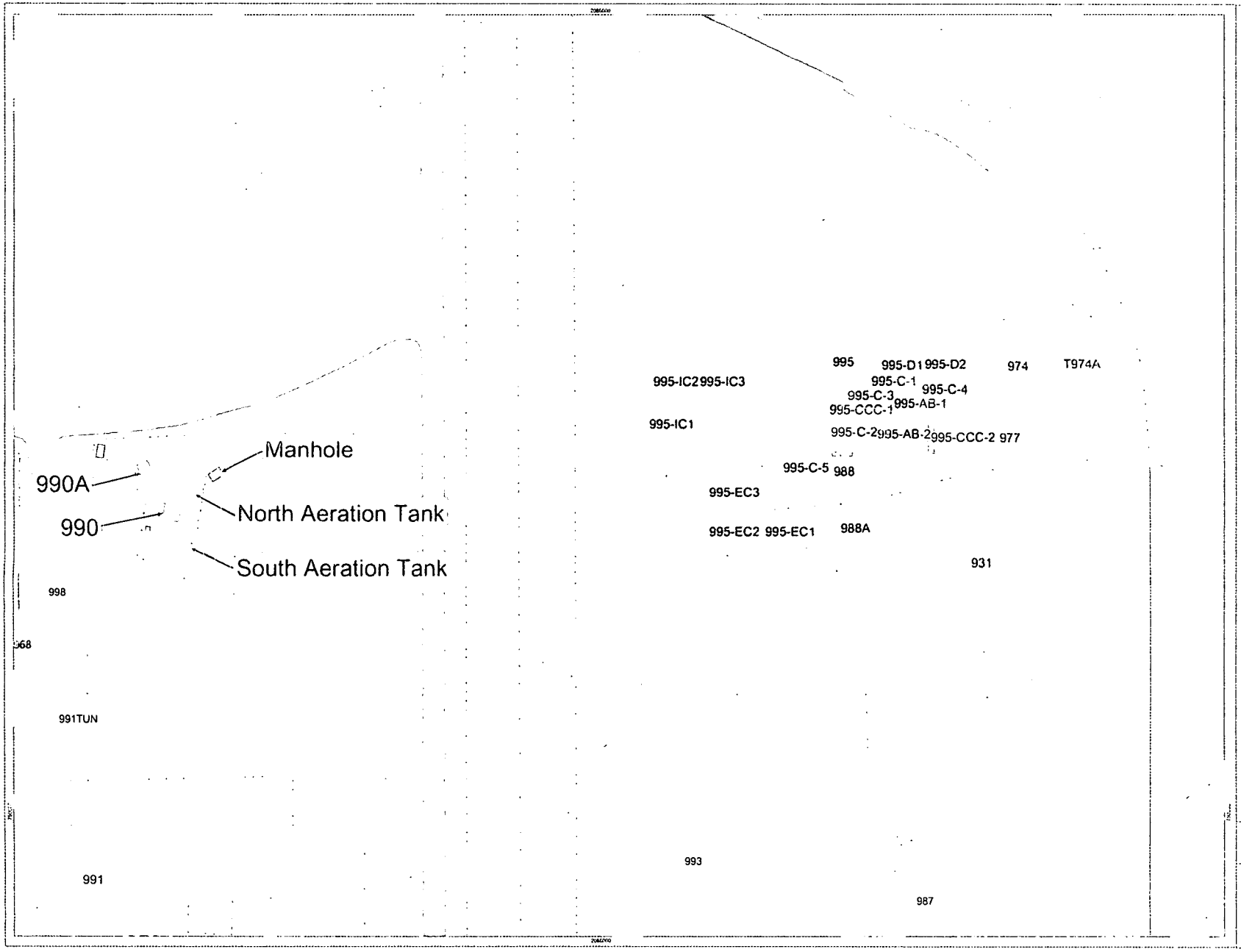
Historical Site Assessment Report for the Area 5-Group 16 Facilities, Dated December 2002, Revision 0.

13

ATTACHMENT A

Facility Location Map

15



Rocky Flats Environmental Technology Site

990 & 990A Location Map

Map Features

- Buildings Remaining
- 990
- 990A
- D&D Facility
- Paved Roads
- Dirt Roads
- Aeration Tanks
- Railroad Removed
- Railroad Remaining
- Fence Removed
- Fence Remaining
- Streams

N

1:461
1 inch equals 38 feet

State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept (303) 966-7707

Prepared by: CH2MHILL

Prepared for: KAISER-HILL

W:\Projects\2004\01-0838\990 location map.mxd

ATTACHMENT B

Historical Site Assessment Report

D&D RISS Facility Characterization
Historical Site Assessment Report
December, 2002 Rev. 0

Facility ID: (AREA 5 GROUP 16) Buildings 952, 988, 990, 990A, 995, and Trailer T974A.
Anticipated Facility Type (1, 2, or 3): Buildings 952, 988, 990, 990A, 995, and Trailer T974A are anticipated Type 1 facilities.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Physical Description

Building 952

Building 952 is a 100 square-foot building constructed in the late 1960s. This building is a non-insulated corrugated metal building mounted on a metal frame. Building 952 was constructed on a concrete slab and has a single entry door and several small vents on each of the four sides.

Building 952 has no utilities.

Building 988

Building 988 is a 1,224 square-foot building originally constructed in 1953 and modified in 1990. The original Building 988 was a cinder block building. In 1990 the building was enlarged. The roof was removed from the original building (the walls and floor remain) and the new structure was constructed around the old building. Under the building are the original wet well and dry well, which are still operational. Building 988 is an insulated concrete structure constructed on a concrete pad.

Building 988 has the following utilities: electric.

Building 990

Building 990 is a 222 square-foot building constructed in the early 1950s. Building 990 is a concrete cinder block building with a concrete foundation and a concrete slab roof and a built-up roofing system. Building 990 is a pre-aeration building that house two air compressors used to aerate raw swage in the north basin (constructed in the early 1950s) and the south basin (added in the 1970s).

Building 990 has the following utilities: electric.

Building 990A

Building 990A is a 200 square-foot building constructed in the early 1970s. Building 990A is a concrete cinder block building with a concrete foundation and a concrete slab roof with built-up roofing system. This building has a trench with a bar screen located in the floor slab.

Building 990A has the following utilities: electric.

17

Building 995

Building 995 is a 6,000 square-foot building originally constructed in 1953. The original building was a poured concrete structure with a concrete foundation and a metal roof with a built-up roofing system. The building has had two additions added to the original structure. The first addition was in the late 1980s and was used to house upgraded monitoring instrumentation and increases the size of the on-site laboratory. The second addition was in the mid 1990s and added an additional on-site laboratory, office space, and restroom facilities. These additions were both constructed of concrete cinder block and a concrete foundation. The grit removed and Bar Screen for the wastewater treatment facility are free standing structures located east of Building 995 and do not have an individual facility number.

Building 995 has the following utilities: electric, natural gas, plant water, plant sanitary, and fire protection is provided by wall mounted fire extinguisher.

Trailer T974A

Trailer T974A is an 320 square-foot modified semi-truck trailer acquired in 1990. This trailer has aluminum sides and roof and a steel floor. This unit is considered a portable unit.

Building T974A has the following utilities: electric.

Historical Operations

Building 952

Building 952 was the Isolated Toxic Gas Storage Building and was operational from the mid 1960s to the mid 1980s. The building was used to store cylinders of toxic gasses. The area around the building was used to vent, neutralize and detoxified excess cylinders of gas. This activity is documented in PAC 900-183 "Gas Detoxification Area. This PAC had its NFA approved in 2001. See the 900-183 PAC for more information.

Building 988

Building 988 is the Tertiary Treatment Pump House and is used to house pumps, sand filters, and has a clear well and a dry well located under the floor slab. The original Building 988 had the roof removed and the large and newer Building 988 was constructed around the old building 988. See the Building Description above for more information about Building 988.

Building 990

Building 990 is the pre-aeration building and is used to house the compressors used to pre-aerate the raw sewage prior to entering the wastewater treatment plant. Raw sewage from both the PA and non-PA areas are piped to the diversion box near Building 990. Sewage may be directed to Building 995 or to the north or south basins (each 60,000 gallons) next to Building 990 as needed. Flow control at Building 990 may be used to regulate sewage during periods of high water usage or for containment of out of specification sewage. The north and south basins are large concrete basins with air diffusers located at the bottom of each basin. The north basin was part of the original Building 990 construction. The south basin was added in the early 1970s. This building and the north and south basins are operational but are normally only used during periods of high water generation.

18

Building 990A

Building 990A houses a Bar-screen filtering unit and radiological monitoring equipment. Some believe that this building was constructed for security purposes and the Bar-screen and radiological monitoring equipment was used to detect and collect objects, which could be floated out of the process building via the sanitary sewer system.

Building 995

Building 995 was the main structure supporting the sanitary sewer system. This building houses support offices, on-site laboratories, furnaces and heat exchanger used to maintain a constant temperature in the system digesters. This building has been expanded several during its useful life. See Building Descriptions section above for more details on the building expansions. The sanitary sewer system received wastewater from a number of different sources. These sources include sinks, toilets, cooling tower blow-down, site laundry and floor drains from some areas in the process buildings. In the early days of operation, process waste with very low levels of radiological and chemical contamination was allowed to be discharge into the sanitary sewer system. This practice ended in the 1970s. In addition, during The 1969 Fire contaminated firewater entered the sanitary sewer system through floor drains. Treated waste is discharged to the B-Series ponds located northeast of the site.

Trailer T974A

Trailer T974A is a modified semi-truck trailer that housed a mobile sludge de-watering unit. This unit is used to de-water the sanitary sludge prior to the sludge being placed in the drying beds in Building 974 and 977.

Current Operational Status

The facilities addressed in this HSA are all currently operational.

Contaminants of Concern

Asbestos

Describe any potential, likely, or known sources of Asbestos:

Building 995 is the only building addressed in this HSA that has an asbestos posting. None of the facilities addressed in this HSA have had a comprehensive building inspection.

Beryllium (Be)

Describe any potential, likely, or known Be production or storage locations:

None of the facilities addressed in this HSA are on the RFETS list of Historic and Present Beryllium Areas.

Summarize any recent Be sampling results:

There is no recent Be data for the facilities addressed in this HSA.

19

Lead

Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):

Based on the age of some of the facilities addressed in this HSA, lead in paint should not be a concern. No processes containing lead were conducted in these facilities.

RCRA/CERCLA Constituents

Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):

The primary chemicals used in the wastewater treatment process were lime and a polymer additive. The sanitary sewer system did not regularly receive RCRA/CERCLA waste streams, but in the past small volume of acids, bases, solvents and photo developing chemical historically where released to the sanitary sewer system. See the IHSS, PAC, or UBC section for additional release information.

Describe any potential, likely, or known spill locations (and sources, if any):

A chromium acid spill in 1989 killed the digestive microbes in the sanitary sewer system, which caused under treated waste to be discharged. This event was reported as part of the sanitary sewers system's NPDES permit.

Describe methods in which spills were mitigated, if any:

None.

PCBs

Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):

No PCB containing processes were housed in any of the facilities addressed in this HSA. No process equipment containing PCBs were located in any of these facilities. Given the age of some of these facilities PCBs in paint may be a concern.

Describe any potential, likely, or known spill locations (and sources, if any):

No PCB spills occurred in any of the Facilities addressed in this HSA.

Describe methods in which spills were mitigated, if any:

No PCB spills occurred in any of the Facilities addressed in this HSA.

Radiological Contaminants

Describe any potential, likely, or known radiological production or storage locations:

Building 952 is located inside the PAC 900-155 "900 Lip Area" which has alpha contamination.

In the early days of the operation, low levels of radioactive material in waste was discharged to the sanitary sewer system. This practice was stopped in the 1970s. The 1969 plutonium fire also caused a discharge of radiological material to the sanitary sewer system. The elevated radiological material in the system was primarily caused by firewater used to control the fire entering the system through the floor drains in the effected areas. PAC 000-500, "Sanitary Sewer System" describes some of the releases to the sanitary sewer system. See the IHSS, PAC, or UBC section for additional release information.

Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):

PAC 900-155 "900 Lip Area" see the 900-155 for more detail about this PAC.

Describe methods in which spills were mitigated, If any:

None.

Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):

Isotopes of concern include uranium and plutonium.

Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):

See section below for information on IHSSs PACs, and UBCs.

Environmental Restoration Concerns

Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):

Building 952 is located on or near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) PAC 900-183 "Gas Detoxification Area" NFA Approved 2001.
2) PAC 900-155 "900 Lip Area", Active.
3) PAC 900-140 "Hazardous Disposal Area", Proposed NFA 1998.

Building 995, 988, 990, 990A T974A 974 and 977 are all associated with following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) PAC 000-500, "Sanitary Sewer System" Active

21

Additional Information

Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):

None

References

Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews):

Sources reviewed to complete this HSA were the RFETS Facility List, the Historical Release Report, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. The WSRIC for those buildings with a WSRIC. In addition, a facility walkdown and interviews were performed.

Waste Volume Estimates and Material Types

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 952	200	0	100	250	0	TBD	N/A
Building 988	2000	0	200	400	0	TBD	N/A
Building 990	400	0	100	0	0	TBD	N/A
Building 990A	300	0	50	0	0	TBD	N/A
Building 995	6000	0	800	0	700	TBD	N/A
Trailer T974A	0	0	400	0	0	TBD	N/A

Further Actions

Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):

Begin the RLC/PDS process.

Note:

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in this report. Newer Data will appear in the RLCR/PDSR.

Prepared By: Doug Bryant / /s/ / December 2002

Name Signature Date

22

ATTACHMENT C

Radiological Data Summaries and Survey Maps

Survey Area: 5	Survey Unit: 990004	Building: 990

Description: Building 990 Interior and Exterior

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0 | Nbr QC Required: 2

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 10 | Nbr QC Performed: 2

Alpha

Maximum:	72.3 dpm/100cm²
Minimum:	-13.5 dpm/100cm²
Mean:	19.8 dpm/100cm²
Standard Deviation:	22.7
QC Maximum:	96.1 dpm/100cm²
QC Minimum:	35.1 dpm/100cm²
QC Mean:	65.6 dpm/100cm²
Transuranic DCGL$_W$:	100.0 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 10

Alpha

Maximum:	3.6 dpm/100cm²
Minimum:	-1.2 dpm/100cm²
Mean:	-0.1 dpm/100cm²
Standard Deviation:	1.2
Transuranic DCGL$_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0 | Nbr Biased Required: 0

Nbr Random Collected: 0 | Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

24

Survey Area: 5	Survey Unit: 990004	Building: 990

Description: Building 990 Interior and Exterior

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	702564	06/13/03	Electra	1681	DP-6	10/18/03	0.218	NA	48.0	NA	T/Q/S
2	510646	06/13/03	Electra	1417	DP-6	07/28/03	0.218	NA	48.0	NA	T/Q/S
3	512590	06/13/03	Electra	1589	DP-6	07/08/03	0.333	NA	48.0	NA	T/S
4	702564	06/13/03	SAC-4	959	NA	07/09/03	0.333	NA	9.0	NA	R
5	702564	06/13/03	SAC-4	952	NA	07/09/03	0.333	NA	9.0	NA	R
6	702564	06/13/03	SAC-4	971	NA	08/06/03	0.333	NA	9.0	NA	R
7	702564	06/13/03	SAC-4	924	NA	10/23/03	0.333	NA	9.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5	Survey Unit: 990004	Building: 990

Description: Building 990 Interior and Exterior

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990004PRP-N001	4	-0.6	N/A	
990004PRP-N002	5	0.3	N/A	
990004PRP-N003	6	-0.9	N/A	
990004PRP-N004	7	3.6	N/A	
990004PRP-N005	4	0.9	N/A	
990004PRP-N006	5	1.8	N/A	
990004PRP-N007	6	-0.9	N/A	
990004PRP-N008	7	-0.9	N/A	
990004PRP-N009	4	-0.6	N/A	
990004PRP-N010	5	0.3	N/A	
990004PRP-N011	6	-0.9	N/A	
990004PRP-N012	7	-0.9	N/A	
990004PRP-N013	4	-0.6	N/A	
990004PRP-N014	5	-1.2	N/A	
990004PRP-N015	6	-0.9	N/A	

Survey Area: 5	Survey Unit: 990004	Building: 990

Description: Building 990 Interior and Exterior

Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990004PBP-N016	7	0.6	N/A	
990004PBP-N017	4	-0.6	N/A	
990004PBP-N018	5	-1.2	N/A	
990004PBP-N019	6	-0.9	N/A	
990004PBP-N020	7	-0.9	N/A	
990004PBP-N021	4	2.4	N/A	
990004PBP-N022	5	-1.2	N/A	
990004PBP-N023	6	0.6	N/A	
990004PBP-N024	7	0.6	N/A	
990004PBP-N025	4	-0.6	N/A	

Comments:

Survey Area: 5	Survey Unit: 990004	Building: 990

Description: Building 990 Interior and Exterior

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990004PRP-N001	2	4.8	N/A	
990004PRP-N002	1	20.0	N/A	
990004PRP-N003	1	36.9	N/A	
990004QRP-N003	2	35.1	N/A	
990004PRP-N004	2	-1.1	N/A	
990004PRP-N005	2	50.7	N/A	
990004PRP-N006	1	-13.5	N/A	
990004QRP-N007	1	96.1	N/A	
990004PRP-N007	2	53.9	N/A	
990004PRP-N008	2	-4.4	N/A	
990004PRP-N009	2	23.2	N/A	
990004PRP-N010	1	-1.1	N/A	
990004PRP-N011	1	72.3	N/A	
990004PRP-N012	2	4.8	N/A	
990004PRP-N013	1	1.6	N/A	
990004PRP-N014	2	56.7	N/A	
990004PRP-N015	1	14.0	N/A	

Survey Area: 5	Survey Unit: 990004	Building: 990

Description: Building 990 Interior and Exterior

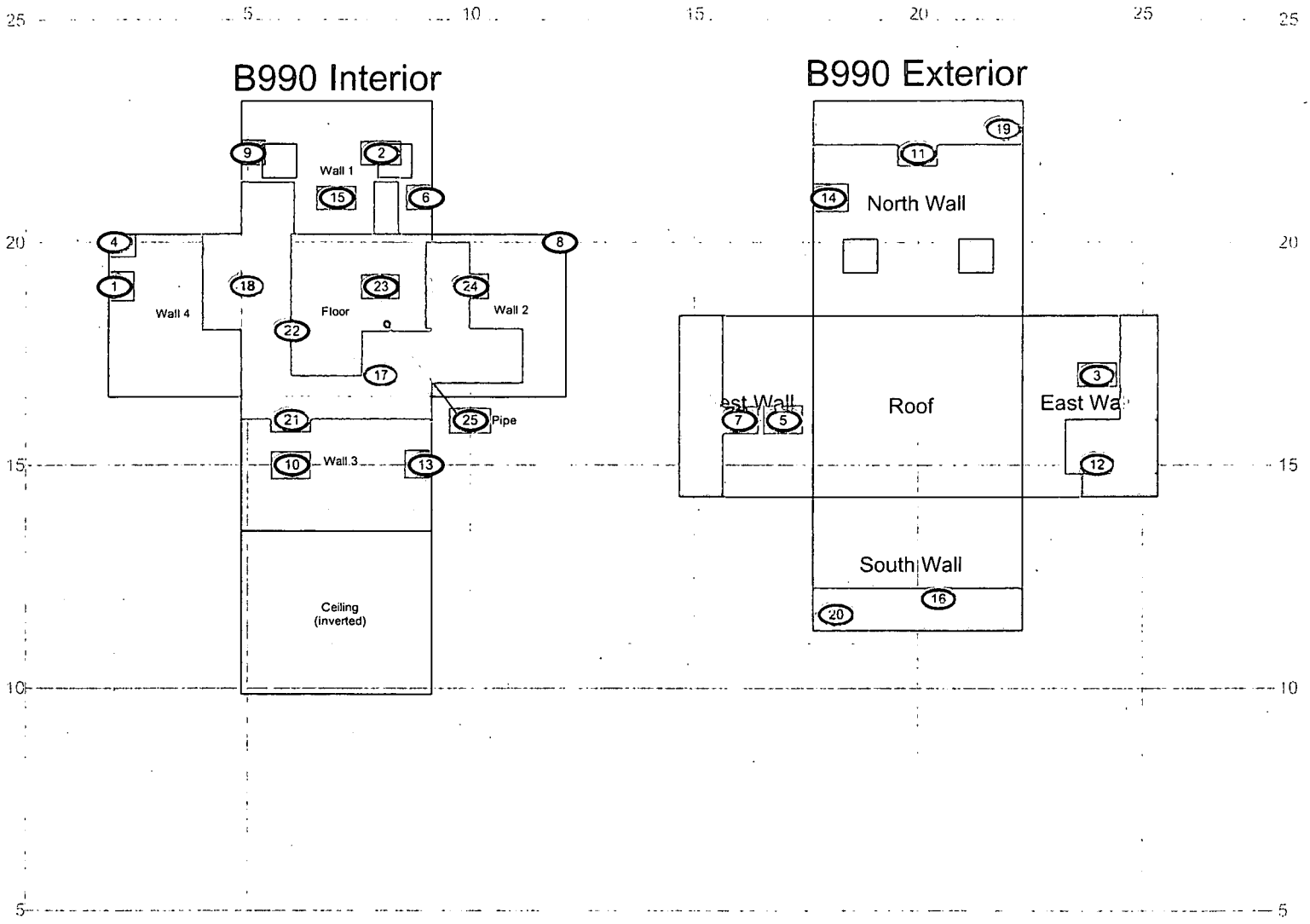
Biased Total Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990004PBP-N016	1	25.3	N/A	
990004PBP-N017	1	25.3	N/A	
990004PBP-N018	1	10.1	N/A	
990004PBP-N019	2	40.4	N/A	
990004PBP-N020	1	46.8	N/A	
990004PBP-N021	1	-2.3	N/A	
990004PBP-N022	2	16.1	N/A	
990004PBP-N023	1	3.7	N/A	
990004PBP-N024	2	3.7	N/A	
990004PBP-N025	2	6.9	N/A	

Comments:

RECONNAISSANCE LEVEL SURVEY FOR BLDG 990

Survey Area: 5 **Survey Unit: 990004** **Classification: 3**
Building: 990
Survey Unit Description: Building 990 Interior & Exterior
Total Area: 159 sq. m. **Total Floor Area: 16 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Area

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 **Prepared for:**

CH2MHILL Communications Group

MAP ID: 03-0221/990-INT-SC **July 9, 2003**

Survey Area: 5	Survey Unit: 990005	Building: 990

Description: Building 990A Interior and Exterior

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0 | Nbr QC Required: 2

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 11 | Nbr QC Performed: 2

Alpha

Maximum:	77.5 dpm/100cm²
Minimum:	-14.2 dpm/100cm²
Mean:	17.9 dpm/100cm²
Standard Deviation:	22.5
QC Maximum:	45.9 dpm/100cm²
QC Minimum:	36.7 dpm/100cm²
QC Mean:	41.3 dpm/100cm²
Transuranic DCGL$_W$:	100.0 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 11

Alpha

Maximum:	3.3 dpm/100cm²
Minimum:	-1.2 dpm/100cm²
Mean:	0.1 dpm/100cm²
Standard Deviation:	1.1
Transuranic DCGL$_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0 | Nbr Biased Required: 0

Nbr Random Collected: 0 | Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: 5	Survey Unit: 990005	Building: 990

Description: Building 990A Interior and Exterior

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	510646	06/16/03	Electra	1417	DP-6	07/28/03	0.218	NA	48.0	NA	T/Q/S
2	702564	06/16/03	Electra	1681	DP-6	10/18/03	0.218	NA	48.0	NA	T/Q/S
3	512590	06/16/03	Electra	1589	DP-6	07/08/03	0.224	NA	48.0	NA	S
4	511390	06/16/03	SAC-4	959	NA	07/09/04	0.333	NA	9.0	NA	R
5	511390	06/13/03	SAC-4	952	NA	07/09/04	0.333	NA	9.0	NA	R
6	511390	06/13/03	SAC-4	971	NA	08/06/03	0.333	NA	9.0	NA	R
7	511390	06/13/03	SAC-4	924	NA	10/23/03	0.333	NA	9.0	NA	R
8	510646	06/18/03	Electra	1260	DP-6	07/10/03	0.223	NA	48.0	NA	T
9	511390	06/26/03	Electra	1136	DP-6	12/18/03	0.218	NA	48.0	NA	T
10	700831	10/26/04	Electra	662	DP-6	03/03/05	0.211	NA	48.0	NA	T/S
11	700831	10/26/04	Ludlum 292	99042	NA	10/26/04	0.349	NA	9.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5	Survey Unit: 990005	Building: 990

Description: Building 990A Interior and Exterior

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990005PRP-N001	4	-0.9	N/A	
990005PRP-N002	5	3.3	N/A	
990005PRP-N003	6	-0.3	N/A	
990005PRP-N004	7	-0.6	N/A	
990005PRP-N005	4	-0.9	N/A	
990005PRP-N006	5	1.8	N/A	
990005PRP-N007	6	-0.3	N/A	
990005PRP-N008	7	-0.6	N/A	
990005PRP-N009	4	0.6	N/A	
990005PRP-N010	5	0.3	N/A	
990005PRP-N011	6	-0.3	N/A	
990005PRP-N012	7	0.9	N/A	
990005PRP-N013	4	-0.9	N/A	
990005PRP-N014	5	-1.2	N/A	
990005PRP-N015	6	1.2	N/A	

Survey Area: 5	Survey Unit: 990005	Building: 990

Description: Building 990A Interior and Exterior

Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990005PBP-N016	7	0.9	N/A	
990005PBP-N017	4	-0.9	N/A	
990005PBP-N018	5	-1.2	N/A	
990005PBP-N019	6	-0.3	N/A	
990005PBP-N020	7	-0.6	N/A	
990005PBP-N021	4	-0.9	N/A	
990005PBP-N022	5	0.3	N/A	
990005PBP-N023	6	1.2	N/A	
990005PBP-N024	7	0.9	N/A	
990005PBP-N025	4	-0.9	N/A	
990005PBP-N026	11	2.0	N/A	

Comments:

Survey Area: 5	Survey Unit: 990005	Building: 990

Description: Building 990A Interior and Exterior

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990005PRP-N001	1	4.1	N/A	
990005PRP-N002	1	62.4	N/A	
990005PRP-N003	2	44.1	N/A	
990005PRP-N004	3	33.6	N/A	
990005PRP-N005	1	37.6	N/A	
990005QRP-N005	2	45.9	N/A	
990005PRP-N006	1	77.5	N/A	
990005PRP-N007	1	-8.2	N/A	
990005PRP-N008	2	6.0	N/A	
990005PRP-N009	2	25.7	N/A	
990005PRP-N010	1	25.7	N/A	
990005QRP-N011	1	36.7	N/A	
990005PRP-N011	2	37.6	N/A	
990005PRP-N012	3	33.6	N/A	
990005PRP-N013	1	-14.2	N/A	
990005PRP-N014	1	19.3	N/A	
990005PRP-N015	1	-5.0	N/A	

Survey Area: 5	Survey Unit: 990005	Building: 990

Description: Building 990A Interior and Exterior

Biased Total Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990005PBP-N016	2	17.1	N/A	
990005PBP-N017	2	35.5	N/A	
990005PBP-N018	1	-1.2	N/A	
990005PBP-N019	1	4.7	N/A	
990005PBP-N020	1	1.5	N/A	
990005PBP-N021	2	1.5	N/A	
990005PBP-N022	2	-1.2	N/A	
990005PBP-N023	2	10.7	N/A	
990005PBP-N024	1	1.5	N/A	
990005PBP-N025	1	-1.2	N/A	
990005PBP-N026	10	16.3	N/A	

Comments: The initial Sample Net Activity for location 13 was 111.3 dpm/100cm2. A concrete surface sample was collected from location 13 and analyzed using the Canberra ISOCS system. No transuranic isotopes were detected. The Sample Net Activity was determined to be from uranium and other naturally occuring isotopes. The Sample Net Activity is below the uranium DCGLw limit (5,000 dpm/100cm2). All sample results are less than the applicable DCGLs, therefore, no further investigation is required. On this basis, the transuranic net activity value (prior to background subtraction) for location 13 was reported as zero (0), therefore the net activity value (after background subtraction) was reported as -14.2 dpm/100cm2 in the TSA data summary.

CANBERRA

Analysis Results Header 7/2/2003 8:46:47 AM Page 1

```
**************************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S        *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**************************************************************************
```

Report Generated On : 7/2/2003 8:46:47 AM

RIN Number : 03S0251
Analytical Batch ID : 0306304453
Line Item Code : RC10C019

990005 MK 11/1/04
~~99A-5-005~~

Filename: S:\GENIE2K\CAMFILES\LI009(D)\ORIG\D1900080.CNF

Concrete Surface Sample
Location #13

Sample Number : 03S0251-001.001
Lab Sample Number : CMLS-3094
Sample Receipt Date : 6/27/2003
Sample Volume Received : 2.23E+001 GRAM

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.230E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 6/26/2003 1:55:00 PM
Acquisition Started : 6/30/2003 4:42:49 PM

Count Time : 7200.0 seconds
Real Time : 7200.6 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 6/24/03
Energy = -0.274 + 0.250*ch + -6.39E-008*ch^2 + 5.91E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 7/2/03
Efficiency Geometry ID : 03S0251-001.001

Analyzed By: Sheri Chambers Date: 7/2/03

Reviewed By: Sean Stanfield Date: 7/2/03

37

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0251-001.001

Analytical Batch ID : 0306304453

Sample Type (Result Identifier): D19

Lab Sample Number : CMLS-3094

Geometry ID : 03S0251-001.001

Filename: S:\GENIE2K\CAMFILES\LI009(D)\ORIG\D1900080.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

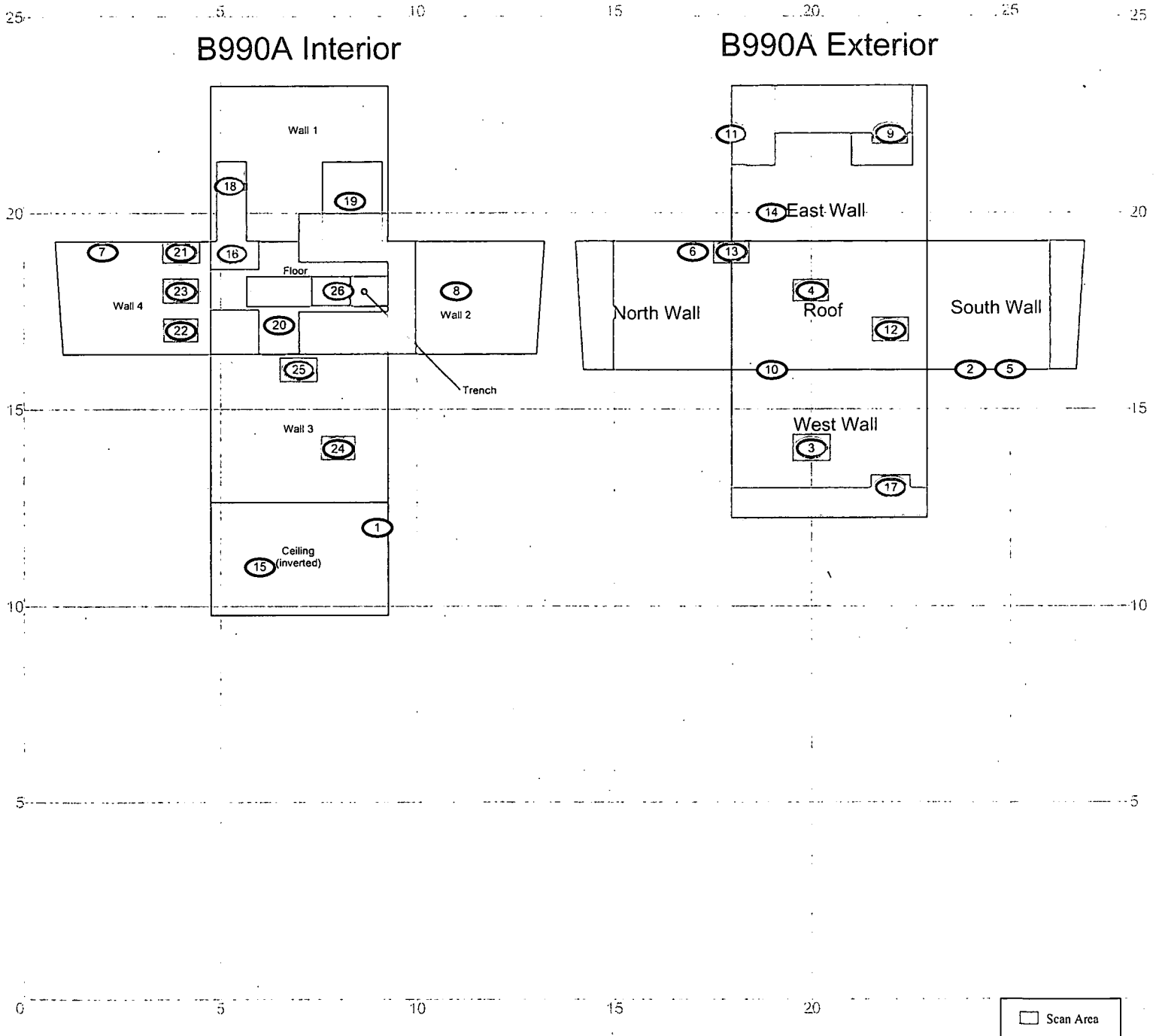
Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	7.65E+000	2.96E+000	3.84E+000
CS-137n	0.00E+000	0.00E+000	4.48E-001
TL-208n	0.00E+000	0.00E+000	4.09E-001
PO-210in	0.00E+000	0.00E+000	3.48E+004
BI-212n	0.00E+000	0.00E+000	5.93E+000
PB-212n	1.06E+000	1.77E-001	2.32E-001
BI-214n	1.01E+000	3.87E-001	5.39E-001
PB-214n	9.00E-001	2.64E-001	4.69E-001
RA-226n	2.25E+000	7.60E-001	2.19E+000
AC-228n	0.00E+000	0.00E+000	1.64E+000
TH-230n	0.00E+000	0.00E+000	1.65E+001
Th-231n	0.00E+000	0.00E+000	1.18E+000
PA-234Mn	0.00E+000	0.00E+000	4.06E+001
PA-234n	0.00E+000	0.00E+000	3.05E-001
U-235	1.39E-001	4.66E-002	1.36E-001
U238/234	0.00E+000	0.00E+000	1.69E+000
AM-241	0.00E+000	0.00E+000	1.88E-001

i - If Po-210 is detected in the spectrum, this peak may be the result of the interaction of Pb-206(n,n') which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

RECONNAISSANCE LEVEL SURVEY FOR BLDG 990A

Survey Area: 5 Survey Unit: 990005 Classification: 3
Building: 990A
Survey Unit Description: Building 990A Interior & Exterior
Total Area: 162 sq. m. Total Floor Area: 13 sq. m.



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 10

Scan Area

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

MAP ID: 03-0221/990A-INT-SC July 10, 2003

Survey Area: 5	Survey Unit: 990006	Building: 990

Description: Building 990 Aeration Tank Area

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0 | Nbr QC Required: 2

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 0 | Nbr QC Performed: 2

Alpha

Maximum:	74.4 dpm/100cm²
Minimum:	-8.1 dpm/100cm²
Mean:	38.3 dpm/100cm²
Standard Deviation:	23.3
QC Maximum:	68.0 dpm/100cm²
QC Minimum:	48.5 dpm/100cm²
QC Mean:	58.3 dpm/100cm²
Transuranic DCGL$_W$:	100.0 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 0

Alpha

Maximum:	3.0 dpm/100cm²
Minimum:	0.0 dpm/100cm²
Mean:	0.6 dpm/100cm²
Standard Deviation:	0.9
Transuranic DCGL$_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0 | Nbr Biased Required: 0

Nbr Random Collected: 0 | Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: 5	Survey Unit: 990006	Building: 990

Description: Building 990 Aeration Tank Area

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	700831	10/26/04	Electra	662	DP-6	03/03/05	0.211	NA	48.0	NA	T/S
2	511390	10/27/04	Electra	1417	DP-6	03/25/05	0.205	NA	48.0	NA	Q
3	700831	10/26/04	SAC-4	952	NA	02/12/05	0.330	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Printed On: 11/01/04 09:30

41

Survey Area: 5	Survey Unit: 990006	Building: 990

Description: Building 990 Aeration Tank Area

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990006PRP-N001	3	1.5	N/A	
990006PRP-N002	3	0.0	N/A	
990006PRP-N003	3	1.5	N/A	
990006PRP-N004	3	3.0	N/A	
990006PRP-N005	3	1.5	N/A	
990006PRP-N006	3	0.0	N/A	
990006PRP-N007	3	0.0	N/A	
990006PRP-N008	3	0.0	N/A	
990006PRP-N009	3	0.0	N/A	
990006PRP-N010	3	0.0	N/A	
990006PRP-N011	3	0.0	N/A	
990006PRP-N012	3	0.0	N/A	
990006PRP-N013	3	1.5	N/A	
990006PRP-N014	3	0.0	N/A	
990006PRP-N015	3	0.0	N/A	

Comments:

42

Survey Area: 5	Survey Unit: 990006	Building: 990

Description: Building 990 Aeration Tank Area

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
990006PRP-N001	1	49.8	N/A	
990006PRP-N002	1	22.3	N/A	
990006PRP-N003	1	48.8	N/A	
990006PRP-N004	1	22.3	N/A	
990006PRP-N005	1	11.8	N/A	
990006PRP-N006	1	72.5	N/A	
990006QRP-N006	2	48.5	N/A	
990006PRP-N007	1	52.1	N/A	
990006PRP-N008	1	25.1	N/A	
990006PRP-N009	1	55.4	N/A	
990006PRP-N010	1	29.9	N/A	
990006PRP-N011	1	-8.1	N/A	
990006PRP-N012	1	45.0	N/A	
990006PRP-N013	1	55.4	N/A	
990006PRP-N014	1	74.4	N/A	
990006QRP-N014	2	68.0	N/A	
990006PRP-N015	1	17.5	N/A	

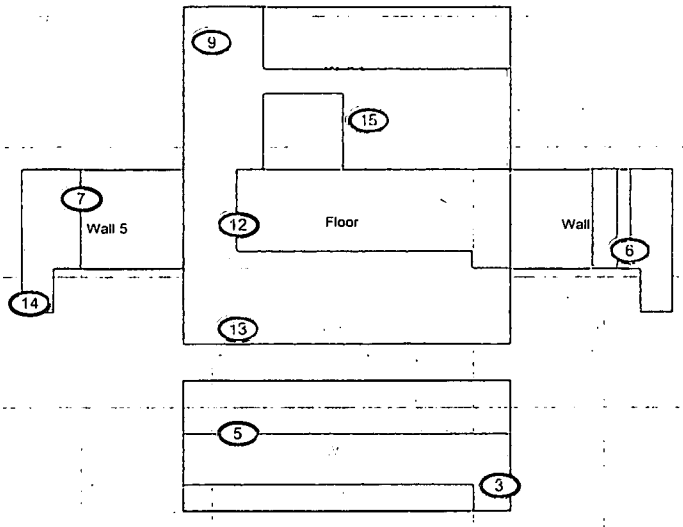
Comments:

43

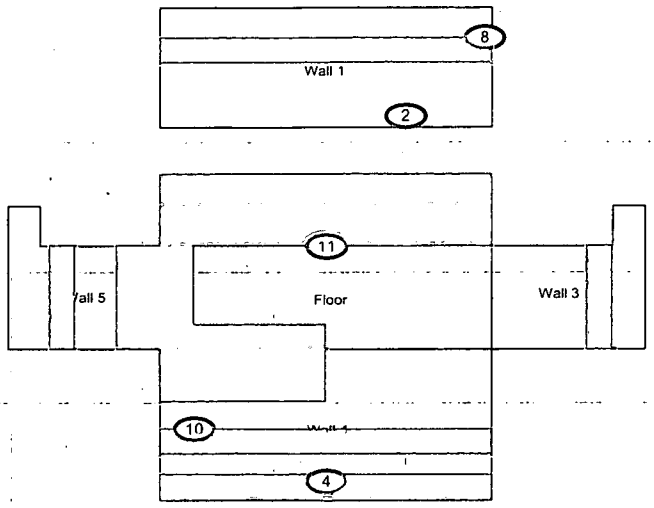
RECONNAISSANCE LEVEL SURVEY FOR 990 TANK AREA

Survey Area: 5 **Survey Unit: 990006** **Classification: 3**
Building: 990
Survey Unit Description: Building 990 Aeration Tank Area
Total Area: 637 sq. m. **Total Floor Area: 143 sq. m.**

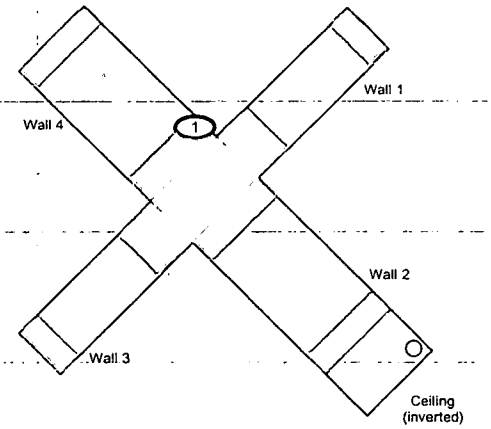
North Aeration Tank



South Aeration Tank



Manhole



Scan Area

SURVEY MAP LEGEND

- (#) Smear & TSA Location
- ◇(#) Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

MAP ID: 03-0221/990-Tanks-SC Oct. 28, 2004

44

****
***** 707/776/777 PROJECT G A M M A SPECTRUM ANALYSIS *****
****

ISOCS Report Generator ISOCSAN.TPL 2/26/96
Report Generated On : 11/4/04 12:31:46 PM

Spectrum File Name : C:\PCNT2K\CAMFILES\MEDIA\MED00278.CNF
Sample Title : MEDIA
Sample Identification : 990 S. Basin #2
Sample Type : MED
Desc. 1 : SOIL
Desc. 2 : 250ml jar @ 0 mm
Desc. 3 :
Desc. 4 :

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 1 - 8192
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 2.117E+002 g

Note: For Point Source, report UNIT = none.

Sample Taken On : 11/4/04 8:30:00 AM
Acquisition Started : 11/4/04 10:12:49 AM

Live Time : 3600.0 seconds
Real Time : 3601.7 seconds

Energy Calibration Used Done On : 7/23/04
Efficiency / Geometry ID : 990SBSN@0MM
Efficiency Calibration Used Done On : 11/4/04
Counted in accordance with procedure : PRO-1754-GENIE2000-1 VERSION 1

Analysis Performed by: G. Madison /s/ 902666 11/4/04

Reviewed by: M. Wesselman /s/ 701184 11/4/04

****
***** PEAK LOCATE REPORT *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Locate Performed on: 11/4/04 12:31:42 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192
Peak Search Sensitivity: 2.50

Peak No.	Centroid Channel	Centroid Uncertainty	Energy (keV)	Peak Significance
1	214.09	0.3608	53.68	2.59
2	253.07	0.1991	63.54	6.22
3	299.22	0.3498	75.10	2.65
4	308.27	0.2491	77.30	4.79
5	347.94	0.3193	87.24	2.61
6	370.46	0.1706	92.87	8.03
7	742.84	0.2003	185.93	6.57
8	954.05	0.1648	238.73	8.41
9	1180.49	0.2877	295.49	2.89
10	1353.85	0.2612	338.76	2.79
11	1407.06	0.2334	352.00	3.73
12	1849.56	0.2961	462.61	2.69
13	2042.38	0.2117	510.76	4.39
14	2331.47	0.1941	583.12	4.69
15	2436.42	0.2244	609.42	3.55
16	3641.23	0.2067	910.52	3.71
17	3874.04	0.2369	968.84	2.93
18	5125.87	0.2633	1281.92	2.50
19	5838.76	0.1256	1460.06	7.23

Errors quoted at 2.000 sigma

****
***** PEAK ANALYSIS REPORT *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Analysis Performed on: 11/4/04 12:31:42 PM
Peak Analysis From Channel: 1
Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	Net Peak Area	Net Area % Uncert.	Continuum Counts
M	1	209-	219	213.84	53.68	3.50E+001	309.23%	1.84E+002
M	2	245-	263	253.28	63.54	4.14E+002	10.83%	3.87E+002
M	3	291-	316	299.53	75.10	1.27E+002	33.92%	3.73E+002
m	4	291-	316	308.33	77.30	2.41E+002	24.14%	4.68E+002
M	5	343-	354	348.09	87.24	5.33E+001	53.80%	2.49E+002
M	6	362-	385	370.60	92.87	5.71E+002	8.89%	4.59E+002
M	7	730-	750	742.84	185.93	1.78E+002	51.71%	1.71E+002
M	8	947-	961	954.03	238.73	2.35E+002	14.68%	1.58E+002
M	9	1171-	1186	1181.12	295.49	4.82E+001	80.03%	7.80E+001
M	10	1344-	1362	1354.18	338.76	7.36E+001	121.63%	6.18E+001
M	11	1398-	1415	1407.16	352.00	5.17E+001	36.73%	8.10E+001
M	12	1844-	1855	1849.60	462.61	1.43E+001	83.12%	3.00E+001
M	13	2031-	2054	2042.19	510.76	1.02E+002	20.53%	5.40E+001
M	14	2323-	2364	2331.63	583.12	8.06E+001	23.67%	6.30E+001
M	15	2430-	2445	2436.85	609.42	4.87E+001	36.04%	4.20E+001
M	16	3634-	3649	3641.26	910.52	3.65E+001	164.08%	3.40E+001
M	17	3867-	3882	3874.57	968.84	1.95E+001	167.56%	3.40E+001
M	18	5118-	5133	5126.91	1281.92	7.37E+000	67.76%	6.00E+000
M	19	5824-	5855	5839.50	1460.06	2.75E+002	11.57%	3.20E+001

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****
****

Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/g)	Activity Uncertainty
K-40	0.909	1460.83*	10.67	1.012E+001	12.92%
TL-208	0.832	72.80	2.14		
		74.97*	6.60	1.048E+000	38.90%
		510.61*	21.60	7.625E-001	24.46%
		583.02*	86.00	1.717E-001	26.47%
		860.30	12.00		
PB-212	0.891	74.81*	9.60	7.203E-001	38.76%
		77.11*	17.50	7.425E-001	30.94%
		87.20*	6.30	4.369E-001	57.43%
		89.80	1.75		
		115.19	0.60		
		238.63*	44.60	4.139E-001	22.14%
		300.09	3.41		
PB-214	0.816	53.17*	1.10	2.219E+000	311.03%
		74.81*	6.33	1.092E+000	38.76%
		77.11*	10.70	1.214E+000	30.94%
		87.20*	3.70	7.439E-001	57.43%
		89.80	1.03		
		241.98	7.49		
		295.21*	19.20	2.398E-001	81.32%
		351.92*	37.20	1.572E-001	38.84%
		785.91	1.10		
RA-226	0.995	186.11*	3.28	3.471E+000	54.41%
Th-234	0.987	63.29*	3.80	6.575E+000	19.86%
		92.57*	5.41	5.371E+000	21.19%

* = Energy line found in the spectrum.
Energy tolerance used was 1.000
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000 sigma

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
****

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/g)	Wt mean Activity Uncertainty	
	K-40	0.909	1.0118E+001	12.92%	
	TL-208	0.832	1.7262E-001	25.27%	
	PB-212	0.891	4.3779E-001	17.84%	
	PB-214	0.816	1.7088E-001	33.37%	
	RA-226	0.995	3.4708E+000	54.41%	
	Th-234	0.987	5.8906E+000	14.57%	* Use for U234/238 value
X	U-235	0.511			

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis

Errors quoted at 2.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 11/4/04 12:31:42 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	
M	10	338.76	2.0441E-002	121.63	Hi error/Ac-228 Peak
M	12	462.61	3.9822E-003	83.12	Ac-228 Peak
M	15	609.42	1.3541E-002	36.04	Bi-214 Peak
M	16	910.52	1.0128E-002	164.08	Hi error/Ac-228 Peak
M	17	968.84	5.4147E-003	167.56	Hi error/Ac-228 Peak
M	18	1281.92	2.0476E-003	67.76	Tl-208 Peak

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** NUCLIDE MDA REPORT *****
****

Detector Name: DET01
Sample Geometry: Soil @0mm
Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/g)	Nuclide MDA (pCi/g)	Activity (pCi/g)
+	K-40	1460.83*	10.67	1.6334E+000	1.63E+000	1.0118E+001
+	RA-226	186.11*	3.28	1.6494E+000	1.65E+000	3.4708E+000
	PA-234M	1001.03	0.59	1.5329E+001	1.53E+001	1.2730E+001
+	Th-234	63.29*	3.80	1.9328E+000	1.35E+000	6.5747E+000
		92.57*	5.41	1.3526E+000		5.3709E+000
	U-235	93.35*	2.50	2.9270E+000	1.00E-001	1.1623E+001
		105.00	1.00	2.5320E+000		4.2280E-001
		109.14	1.50	1.7367E+000		6.7440E-002
		143.76	10.50	2.7912E-001		1.8526E-001
		163.35	4.70	5.3954E-001		2.1822E-002
		185.71*	54.00	1.0019E-001		2.1082E-001
		202.12	1.00	2.6841E+000		8.5282E-003
		205.31	4.70	6.3990E-001		1.3964E-001
	Pu-239	129.28	0.01	4.1095E+002	4.11E+002	1.3378E+002
		413.69	0.00	2.3156E+003		-1.3142E+002
	AM-241	26.34	2.40	4.6289E+000	1.24E-001	8.4827E-001
		59.54	35.70	1.2368E-001		6.1409E-002
		125.29	0.00	5.7309E+002		7.4349E+001
		662.43	0.00	1.2363E+004		-6.9188E+003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

****
***** 707/776/777 PROJECT G A M M A SPECTRUM ANALYSIS *****
****

ISOCS Report Generator ISOCSAN.TPL 2/26/96
Report Generated On : 11/4/04 1:51:54 PM

Spectrum File Name : C:\PCNT2K\CAMFILES\MEDIA\MED00279.CNF
Sample Title : MEDIA
Sample Identification : 990 N. Basin #1
Sample Type : MED
Desc. 1 : SOIL
Desc. 2 : 250ml jar @ 0 mm
Desc. 3 :
Desc. 4 :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 1 - 8192
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 1.980E+002 g

Note: For Point Source, report UNIT = none.

Sample Taken On : 11/4/04 8:30:00 AM
Acquisition Started : 11/4/04 12:26:18 PM

Live Time : 3600.0 seconds
Real Time : 3601.9 seconds

Energy Calibration Used Done On : 7/23/04
Efficiency / Geometry ID : 990SBSN@0MM
Efficiency Calibration Used Done On : 11/4/04
Counted in accordance with procedure : PRO-1754-GENIE2000-1 VERSION 1

Analysis Performed by: G. Madison /s/ 902666 11/4/04

Reviewed by: M. Wesselman /s/ 701184 11/4/04

51

****
***** P E A K L O C A T E R E P O R T *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Locate Performed on: 11/4/04 1:50:58 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192
Peak Search Sensitivity: 3.00

Peak No.	Centroid Channel	Centroid Uncertainty	Energy (keV)	Peak Significance
1	252.96	0.1670	63.48	10.03
2	298.13	0.2711	74.82	3.81
3	308.68	0.2082	77.34	5.18
4	348.09	0.2767	87.36	3.86
5	358.51	0.2961	89.90	3.96
6	370.21	0.1471	92.82	12.28
7	393.24	0.3084	98.63	3.24
8	742.76	0.1861	185.86	6.73
9	953.81	0.1502	238.67	9.62
10	1180.05	0.2674	295.24	3.56
11	1312.00	0.2593	328.23	3.85
12	1351.94	0.2204	338.19	4.05
13	1407.48	0.1953	352.03	5.17
14	2041.34	0.2044	510.60	4.71
15	2329.86	0.2019	582.78	4.20
16	2434.32	0.2050	608.79	4.26
17	2905.29	0.2467	726.31	3.15
18	3642.31	0.1948	910.68	3.22
19	3999.55	0.2126	1000.25	3.18
20	5838.91	0.1184	1459.97	8.14

Errors quoted at 2.000 sigma

****
***** PEAK ANALYSIS REPORT *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Analysis Performed on: 11/4/04 1:50:59 PM
Peak Analysis From Channel: 1
Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	Net Peak Area	Net Area % Uncert.	Continuum Counts
M	1	245-	261	253.04	63.48	6.27E+002	8.92%	5.14E+002
M	2	287-	314	298.39	74.82	1.73E+002	21.97%	5.59E+002
m	3	287-	314	308.46	77.34	3.03E+002	14.32%	4.99E+002
M	4	344-	385	348.55	87.36	8.47E+001	38.00%	3.13E+002
m	5	344-	385	358.71	89.90	8.19E+001	38.25%	4.80E+002
m	6	344-	385	370.38	92.82	1.03E+003	6.02%	4.51E+002
M	7	388-	405	393.62	98.63	1.18E+002	79.64%	2.41E+002
M	8	733-	750	742.55	185.86	2.35E+002	42.45%	1.24E+002
M	9	944-	961	953.81	238.67	3.65E+002	10.94%	1.67E+002
M	10	1175-	1187	1180.09	295.24	4.28E+001	42.10%	5.69E+001
M	11	1306-	1318	1312.05	328.23	3.43E+001	47.25%	4.88E+001
M	12	1344-	1360	1351.91	338.19	9.21E+001	23.78%	7.44E+001
M	13	1397-	1415	1407.28	352.03	1.15E+002	61.90%	6.41E+001
M	14	2033-	2051	2041.57	510.60	8.47E+001	42.69%	6.65E+001
M	15	2323-	2339	2330.27	582.78	7.96E+001	24.82%	4.04E+001
M	16	2426-	2442	2434.33	608.79	5.78E+001	31.53%	4.46E+001
M	17	2899-	2912	2904.43	726.31	1.72E+001	64.69%	2.10E+001
M	18	3632-	3651	3641.92	910.68	6.03E+001	119.01%	1.25E+001
M	19	3992-	4007	4000.23	1000.25	2.71E+001	49.85%	1.60E+001
M	20	5823-	5855	5839.12	1459.97	3.53E+002	8.05%	2.06E+001

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/g)	Activity Uncertainty
K-40	0.887	1460.83*	10.67	1.384E+001	9.89%
TL-208	0.827	72.80	2.14		
		74.97*	6.60	1.497E+000	29.02%
		510.61*	21.60	6.728E-001	44.71%
		583.02*	86.00	1.797E-001	27.51%
		860.30	12.00		
BI-212	0.409	39.86	1.10		
		727.17*	11.80	3.449E-001	65.16%
		785.42	2.00		
		1620.56	2.75		
PB-212	0.931	74.81*	9.60	1.029E+000	28.82%
		77.11*	17.50	9.729E-001	24.08%
		87.20*	6.30	7.269E-001	42.97%
		89.80*	1.75	2.514E+000	43.04%
		115.19	0.60		
		238.63*	44.60	6.778E-001	19.86%
		300.09	3.41		
PB-214	0.822	53.17	1.10		
		74.81*	6.33	1.561E+000	28.82%
		77.11*	10.70	1.591E+000	24.08%
		87.20*	3.70	1.238E+000	42.97%
		89.80*	1.03	4.271E+000	43.04%
		241.98	7.49		
		295.21*	19.20	2.251E-001	44.52%
		351.92*	37.20	3.700E-001	63.18%
		785.91	1.10		
RA-226	0.990	186.11*	3.28	4.838E+000	45.70%
PA-234M	0.908	1001.03*	0.59	1.422E+001	50.15%
Th-234	0.992	63.29*	3.80	1.037E+001	18.91%
		92.57*	5.41	1.022E+001	20.17%

* = Energy line found in the spectrum.
Energy tolerance used was 1.000
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000 sigma

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
****

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/g)	Wt mean Activity Uncertainty	
	K-40	0.887	1.3839E+001	9.89%	
	TL-208	0.827	1.8007E-001	26.41%	
	BI-212	0.409	3.4493E-001	65.16%	
	PB-212	0.931	7.1467E-001	14.67%	
	PB-214	0.822	2.5831E-001	34.38%	
	RA-226	0.990	4.8379E+000	45.70%	
	PA-234M	0.908	1.4216E+001	50.15%	
	Th-234	0.992	1.0301E+001	13.80%	* Use for U234/238 value
X	U-235	0.513			

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis

Errors quoted at 2.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 11/4/04 1:50:58 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	
M	7	98.63	3.2747E-002	79.64	Pa-234m Peak
M	11	328.23	9.5196E-003	47.25	Ac-228 Peak
M	12	338.19	2.5588E-002	23.78	Ac-228 Peak
M	16	608.79	1.6059E-002	31.53	Bi-214 Peak
M	18	910.68	1.6753E-002	119.01	Ac-228 Peak

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** NUCLIDE MDA REPORT *****
****

Detector Name: DET01
Sample Geometry: Soil @0mm
Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/g)	Nuclide MDA (pCi/g)	Activity (pCi/g)
+	K-40	1460.83*	10.67	1.4309E+000	1.43E+000	1.3839E+001
+	RA-226	186.11*	3.28	1.4140E+000	1.41E+000	4.8379E+000
+	PA-234M	1001.03*	0.59	1.1183E+001	1.12E+001	1.4216E+001
+	Th-234	63.29*	3.80	2.2253E+000	1.00E+000	1.0371E+001
		92.57*	5.41	1.0033E+000		1.0223E+001
	U-235	93.35*	2.50	2.1712E+000	8.59E-002	2.2123E+001
		105.00	1.00	2.9153E+000		2.9851E-001
		109.14	1.50	2.0552E+000		5.7182E-001
		143.76	10.50	3.0996E-001		1.8563E-001
		163.35	4.70	6.4744E-001		1.6109E-001
		185.71*	54.00	8.5888E-002		2.9386E-001
		202.12	1.00	2.5409E+000		-2.7912E+000
		205.31	4.70	7.0381E-001		-4.0740E-002
	Pu-239	129.28	0.01	4.9835E+002	4.98E+002	2.7286E+002
		413.69	0.00	2.9464E+003		4.2903E+002
	AM-241	26.34	2.40	4.9320E+000	1.52E-001	-3.7359E-001
		59.54	35.70	1.5206E-001		1.4841E-001
		125.29	0.00	6.7961E+002		-9.8688E+001
		662.43	0.00	1.5555E+004		-4.4921E+003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

```
**************************************************************************
*****  707/776/777 PROJECT  G A M M A   SPECTRUM   ANALYSIS          *****
**************************************************************************

ISOCS Report Generator            ISOCSAN.TPL  2/26/96
Report Generated On               : 11/4/04   2:53:13 PM

Spectrum File Name                : C:\PCNT2K\CAMFILES\MEDIA\MED00280.CNF
Sample Title                      : MEDIA
Sample Identification             : 990 N. Basin #2
Sample Type                       : MED
Desc. 1 :
Desc. 2 : 250ml jar @ 0 mm
Desc. 3 :
Desc. 4 :

Peak Locate Threshold             :  3.00
Peak Locate Range (in channels)   :     1 -  8192
Peak Area Range (in channels)     :     1 -  8192
Identification Energy Tolerance   :    1.000 keV

Sample Size                       :  2.226E+002 g

Note:  For Point Source,   report UNIT = none.

Sample Taken On                   : 11/4/04   8:30:00 AM
Acquisition Started               : 11/4/04   1:27:52 PM

Live Time                         :     3600.0 seconds
Real Time                         :     3602.3 seconds


Energy Calibration Used Done On   : 7/23/04
Efficiency / Geometry ID          : 990SBSN@0MM
Efficiency Calibration Used Done On : 11/4/04
Counted in accordance with procedure : PRO-1754-GENIE2000-1 VERSION 1

Analysis Performed by:  G. Madison   /s/ 902666 11/4/04

Reviewed by:  M. Wesselman /s/ 701184 11/4/04
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57

****
***** P E A K L O C A T E R E P O R T *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Locate Performed on: 11/4/04 2:53:11 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192
Peak Search Sensitivity: 3.00

Peak No.	Centroid Channel	Centroid Uncertainty	Energy (keV)	Peak Significance
1	91.46	0.3187	23.21	4.15
2	253.04	0.1411	63.51	13.44
3	308.36	0.2075	77.32	7.20
4	370.48	0.1201	92.85	17.33
5	393.25	0.2635	98.56	3.48
6	450.97	0.3015	112.98	3.39
7	742.34	0.1623	185.79	8.50
8	954.03	0.1384	238.71	11.96
9	1179.91	0.1998	295.17	5.80
10	1352.47	0.2058	338.36	5.49
11	1407.17	0.1926	352.03	5.79
12	2040.62	0.2090	510.70	3.84
13	2331.21	0.1625	582.96	6.44
14	2434.97	0.1846	608.96	5.11
15	3061.82	0.2226	765.84	3.33
16	3640.18	0.1852	910.28	4.56
17	3999.91	0.2009	1000.25	3.11
18	5839.59	0.1189	1459.99	7.63

Errors quoted at 2.000 sigma

****
***** P E A K A N A L Y S I S R E P O R T *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Analysis Performed on: 11/4/04 2:53:11 PM
Peak Analysis From Channel: 1
Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	Net Peak Area	Net Area % Uncert.	Continuum Counts
M	1	83-	98	91.94	23.21	1.02E+002	28.02%	2.20E+002
M	2	246-	264	253.15	63.51	1.44E+003	5.48%	8.46E+002
M	3	304-	314	308.38	77.32	1.95E+002	49.52%	6.41E+002
M	4	362-	387	370.51	92.85	2.12E+003	4.34%	1.11E+003
M	5	387-	402	393.35	98.56	1.52E+002	23.14%	3.64E+002
M	6	446-	456	451.03	112.98	5.50E+001	54.73%	2.65E+002
M	7	734-	751	742.30	185.79	3.95E+002	42.30%	2.45E+002
M	8	941-	962	953.96	238.71	4.87E+002	9.62%	2.94E+002
M	9	1172-	1186	1179.82	295.17	9.77E+001	77.28%	7.31E+001
M	10	1344-	1362	1352.59	338.36	1.02E+002	44.54%	9.98E+001
M	11	1392-	1416	1407.27	352.03	1.50E+002	56.55%	1.16E+002
M	12	2031-	2053	2041.95	510.70	1.29E+002	17.39%	5.75E+001
M	13	2319-	2340	2331.02	582.96	1.70E+002	46.92%	4.13E+001
M	14	2426-	2442	2434.99	608.96	9.06E+001	23.51%	4.89E+001
M	15	3055-	3069	3062.54	765.84	4.19E+001	379.31%	3.56E+001
M	16	3632-	3648	3640.31	910.28	7.07E+001	27.61%	3.83E+001
M	17	3992-	4011	4000.22	1000.25	4.95E+001	33.69%	3.00E+001
M	18	5822-	5855	5839.21	1459.99	3.67E+002	9.70%	2.55E+001

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****
****

Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/g)	Activity Uncertainty
K-40	0.892	1460.83*	10.67	1.222E+001	11.28%
TL-208	0.692	72.80	2.14		
		74.97	6.60		
		510.61*	21.60	8.764E-001	21.88%
		583.02*	86.00	3.291E-001	48.40%
		860.30	12.00		
PB-212	0.556	74.81	9.60		
		77.11*	17.50	5.600E-001	53.17%
		87.20	6.30		
		89.80	1.75		
		115.19	0.60		
		238.63*	44.60	7.845E-001	19.16%
		300.09	3.41		
PB-214	0.568	53.17	1.10		
		74.81	6.33		
		77.11*	10.70	9.159E-001	53.17%
		87.20	3.70		
		89.80	1.03		
		241.98	7.49		
		295.21*	19.20	4.438E-001	78.62%
		351.92*	37.20	4.163E-001	57.94%
		785.91	1.10		
RA-226	0.984	186.11*	3.28	7.074E+000	45.56%
PA-234M	0.908	1001.03*	0.59	2.218E+001	34.13%
Th-234	0.989	63.29*	3.80	2.160E+001	17.54%
		92.57*	5.41	1.856E+001	19.73%

* = Energy line found in the spectrum.
Energy tolerance used was 1.000
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000 sigma

60

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
****

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/g)	Wt mean Activity Uncertainty	
	K-40	0.892	1.2219E+001	11.28%	
	TL-208	0.692	3.2909E-001	47.94%	
	PB-212	0.556	6.9759E-001	19.52%	
	PB-214	0.568	3.3261E-001	56.06%	
	RA-226	0.984	7.0743E+000	45.56%	
	PA-234M	0.908	2.2176E+001	34.13%	
	Th-234	0.989	2.0027E+001	13.15%	* Use for U234/238 value
X	U-235	0.515			

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis

Errors quoted at 2.000 sigma

61

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 11/4/04 2:53:11 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	
M	1	23.21	2.8374E-002	28.02	Cd X-ray
M	5	98.56	4.2297E-002	23.14	Pa-234m Peak
M	6	112.98	1.5283E-002	54.73	Th-234 peak
M	10	338.36	2.8441E-002	44.54	Ac-228 Peak
M	14	608.96	2.5153E-002	23.51	Bi-214 Peak
M	15	765.84	1.1649E-002	379.31	Hi Error/Pa-234m Pk
M	16	910.28	1.9653E-002	27.61	Ac-228 Peak

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** NUCLIDE MDA REPORT *****
****

Detector Name: DET01
Sample Geometry: Soil@0mm
Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/g)	Nuclide MDA (pCi/g)	Activity (pCi/g)
+	K-40	1460.83*	10.67	1.3584E+000	1.36E+000	1.2219E+001
+	RA-226	186.11*	3.28	1.7122E+000	1.71E+000	7.0743E+000
+	PA-234M	1001.03*	0.59	1.6302E+001	1.63E+001	2.2176E+001
+	Th-234	63.29*	3.80	2.6808E+000	2.00E+000	2.1603E+001
		92.57*	5.41	2.0043E+000		1.8556E+001
	U-235	93.35*	2.50	4.3372E+000	1.04E-001	4.0155E+001
		105.00	1.00	3.2637E+000		1.8876E+000
		109.14	1.50	2.1170E+000		-6.9428E-001
		143.76	10.50	3.3768E-001		3.9063E-001
		163.35	4.70	6.7157E-001		4.6463E-001
		185.71*	54.00	1.0400E-001		4.2970E-001
		202.12	1.00	2.9169E+000		-6.2594E-002
		205.31	4.70	7.7343E-001		4.9550E-001
	Pu-239	129.28	0.01	5.2523E+002	5.25E+002	2.9272E+002
		413.69	0.00	2.5648E+003		-4.2903E+002
	AM-241	26.34	2.40	6.1315E+000	1.70E-001	4.8200E+000
		59.54	35.70	1.6994E-001		1.2602E-001
		125.29	0.00	7.2639E+002		2.2394E+002
		662.43	0.00	1.9087E+004		9.8739E+003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

****
***** 707/776/777 PROJECT G A M M A SPECTRUM ANALYSIS *****
****

ISOCS Report Generator ISOCSAN.TPL 2/26/96
Report Generated On : 11/4/04 12:36:52 PM

Spectrum File Name : C:\PCNT2K\CAMFILES\MEDIA\MED00277.CNF
Sample Title : MEDIA
Sample Identification : 990 S. Basin #1
Sample Type : MED
Desc. 1 : SOIL
Desc. 2 : 250ml jar @ 0 mm
Desc. 3 :
Desc. 4 :

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 1 - 8192
Peak Area Range (in channels) : 1 - 8192
Identification Energy Tolerance : 1.000 keV

Sample Size : 2.257E+002 g

Note: For Point Source, report UNIT = none.

Sample Taken On : 11/4/04 8:30:00 AM
Acquisition Started : 11/4/04 9:11:50 AM

Live Time : 3600.0 seconds
Real Time : 3601.7 seconds

Energy Calibration Used Done On : 7/23/04
Efficiency / Geometry ID : 990SBSN@0MM
Efficiency Calibration Used Done On : 11/4/04
Counted in accordance with procedure : PRO-1754-GENIE2000-1 VERSION 1

Analysis Performed by: G. Madison /s/ 902666 11/4/04

Reviewed by: M. Wesselman /s/ 701184 11/4/04

64

****
***** PEAK LOCATE REPORT *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Locate Performed on: 11/4/04 12:36:38 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192
Peak Search Sensitivity: 2.50

Peak No.	Centroid Channel	Centroid Uncertainty	Energy (keV)	Peak Significance
1	237.73	0.3742	59.67	2.92
2	252.87	0.2585	63.47	4.13
3	298.66	0.3165	75.04	3.37
4	308.66	0.2273	77.34	5.83
5	349.64	0.3084	87.63	3.32
6	358.63	0.3557	89.90	2.75
7	370.47	0.2137	92.90	5.14
8	496.21	0.3471	124.28	2.91
9	742.09	0.2148	185.82	4.80
10	953.74	0.1625	238.69	7.41
11	1080.07	0.3164	270.20	2.65
12	1179.70	0.2537	295.32	3.56
13	1246.62	0.2872	311.87	3.02
14	1351.68	0.2190	338.16	4.56
15	1406.58	0.1942	351.90	5.60
16	1850.13	0.2615	462.68	2.99
17	2042.05	0.2162	510.60	3.43
18	2331.44	0.1957	583.13	4.84
19	2433.84	0.2101	608.63	4.49
20	3642.15	0.2039	910.81	3.51
21	5839.46	0.1207	1460.11	7.56

Errors quoted at 2.000 sigma

****
***** PEAK ANALYSIS REPORT *****
****

Detector Name: DET01
Sample Title: MEDIA
Peak Analysis Performed on: 11/4/04 12:36:38 PM
Peak Analysis From Channel: 1
Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	Net Peak Area	Net Area % Uncert.	Continuum Counts
M	1	227-	260	237.81	59.67	9.95E+001	63.09%	3.25E+002
m	2	227-	260	253.00	63.47	2.03E+002	56.67%	3.78E+002
M	3	294-	317	299.28	75.04	1.12E+002	29.33%	2.92E+002
m	4	294-	317	308.48	77.34	2.48E+002	15.31%	3.86E+002
M	5	344-	385	349.64	87.63	6.29E+001	35.99%	2.20E+002
m	6	344-	385	358.70	89.90	6.58E+001	33.38%	3.31E+002
m	7	344-	385	370.73	92.90	4.03E+002	8.38%	3.02E+002
M	8	493-	504	496.25	124.28	3.46E+001	55.31%	9.60E+001
M	9	736-	748	742.40	185.82	1.48E+002	18.49%	9.91E+001
M	10	944-	960	953.89	238.69	3.34E+002	31.99%	1.47E+002
M	11	1076-	1086	1079.92	270.20	1.94E+001	83.58%	5.78E+001
M	12	1173-	1189	1180.40	295.32	5.67E+001	32.05%	5.95E+001
M	13	1240-	1253	1246.63	311.87	2.65E+001	61.18%	6.48E+001
M	14	1343-	1360	1351.77	338.16	6.79E+001	29.89%	7.88E+001
M	15	1399-	1414	1406.76	351.90	8.78E+001	24.55%	6.00E+001
M	16	1845-	1857	1849.87	462.68	2.62E+001	52.92%	2.93E+001
M	17	2029-	2050	2041.57	510.60	8.80E+001	81.75%	6.33E+001
M	18	2322-	2340	2331.69	583.13	8.22E+001	24.42%	4.51E+001
M	19	2427-	2440	2433.71	608.63	4.36E+001	38.58%	3.68E+001
M	20	3635-	3650	3642.43	910.81	4.88E+001	33.72%	2.40E+001
M	21	5825-	5856	5839.70	1460.11	3.32E+002	32.76%	2.80E+001

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

66

****
***** NUCLIDE IDENTIFICATION REPORT *****
****

Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/g)	Activity Uncertainty
K-40	0.920	1460.83*	10.67	1.156E+001	33.26%
TL-208	0.833	72.80	2.14		
		74.97*	6.60	8.918E-001	34.96%
		510.61*	21.60	6.259E-001	82.83%
		583.02*	86.00	1.661E-001	27.15%
		860.30	12.00		
PB-212	0.927	74.81*	9.60	6.131E-001	34.80%
		77.11*	17.50	7.362E-001	24.68%
		87.20*	6.30	4.955E-001	41.20%
		89.80*	1.75	1.855E+000	38.78%
		115.19	0.60		
		238.63*	44.60	5.606E-001	36.03%
		300.09	3.41		
PB-214	0.821	53.17	1.10		
		74.81*	6.33	9.299E-001	34.80%
		77.11*	10.70	1.204E+000	24.68%
		87.20*	3.70	8.437E-001	41.20%
		89.80*	1.03	3.152E+000	38.78%
		241.98	7.49		
		295.21*	19.20	2.686E-001	35.16%
		351.92*	37.20	2.539E-001	27.60%
		785.91	1.10		
Th-234	0.987	63.29*	3.80	3.136E+000	59.07%
		92.57*	5.41	3.651E+000	20.98%
U-235	0.515	93.35*	2.50	7.901E+000	20.90%
		105.00	1.00		
		109.14	1.50		
		143.76	10.50		
		163.35	4.70		
		185.71*	54.00	1.676E-001	24.98%
		202.12	1.00		
		205.31	4.70		
AM-241	0.941	26.34	2.40		
		59.54*	35.70	1.723E-001	66.13%
		125.29	0.00		
		662.43	0.00		

* = Energy line found in the spectrum.
Energy tolerance used was 1.000
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000 sigma

67

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
****

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/g)	Wt mean Activity Uncertainty	
	K-40	0.920	1.1563E+001	33.26%	
	TL-208	0.833	1.6165E-001	26.75%	
	PB-212	0.927	4.8907E-001	20.91%	
	PB-214	0.821	2.5531E-001	21.80%	
X	RA-226	0.987			
	Th-234	0.987	3.5103E+000	20.10%	* Use for U234/238 value
	AM-241	0.941	1.7234E-001	66.13%	

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis

Errors quoted at 2.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 11/4/04 12:36:38 PM
Peak Locate From Channel: 1
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	
M	8	124.28	9.6069E-003	55.31	Bi-212/Bkscter PK
M	11	270.20	5.3753E-003	83.58	Ac-228 Peak
M	13	311.87	7.3596E-003	61.18	Background peak
M	14	338.16	1.8853E-002	29.89	Ac-228 Peak
M	16	462.68	7.2906E-003	52.92	Ac-228 Peak
M	19	608.63	1.2125E-002	38.58	Bi-214 Peak
M	20	910.81	1.3547E-002	33.72	Ac-228 Peak

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 2.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

Detector Name: DET01
Sample Geometry: Soil @0mm
Sample Title: MEDIA
Nuclide Library Used: C:\GENIE2K\CAMFILES\Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/g)	Nuclide MDA (pCi/g)	Activity (pCi/g)
+	K-40	1460.83*	10.67	1.4505E+000	1.45E+000	1.1563E+001
	RA-226	186.11*	3.28	1.0387E+000	1.04E+000	2.7599E+000
	PA-234M	1001.03	0.59	9.9765E+000	9.98E+000	2.2230E+000
+	Th-234	63.29*	3.80	1.4409E+000	7.56E-001	3.1359E+000
		92.57*	5.41	7.5605E-001		3.6513E+000
	U-235	93.35*	2.50	1.6361E+000	6.31E-002	7.9015E+000
		105.00	1.00	2.3279E+000		7.3269E-001
		109.14	1.50	1.7011E+000		1.9000E-001
		143.76	10.50	2.5064E-001		1.0820E-001
		163.35	4.70	5.0272E-001		-1.7428E-001
		185.71*	54.00	6.3089E-002		1.6764E-001
		202.12	1.00	2.6739E+000		1.7903E-001
		205.31	4.70	5.4758E-001		8.2393E-002
	Pu-239	129.28	0.01	4.1918E+002	4.19E+002	3.2278E+002
		413.69	0.00	2.3475E+003		-1.3948E+003
+	AM-241	26.34	2.40	4.6007E+000	1.50E-001	-4.5199E-001
		59.54*	35.70	1.4998E-001		**1.7234E-001**
		125.29	0.00	6.1837E+002		2.5855E+002
		662.43	0.00	1.5767E+004		1.1383E+003

\+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
\> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Ludlum	Mfg.	Eberline	Mfg.	NE Electra
Model	2929	Model	SAC-4	Model	DP-6
Serial #	N/A	Serial #	924	Serial #	662
Cal Due	N/A	Cal Due	2/5/05	Cal Due	3/3/05
Bkg	N/A cpmα	Bkg	0.0 cpmα	Bkg	2.0 cpmα
Efficiency	N/A %	Efficiency	33.00 %	Efficiency	21.10 %
MDA	18 dpmα	MDA	20 dpmα	MDA	44 dpmα
Mfg.	Ludlum	Mfg.	Eberline	Mfg.	NE Electra
Model	2929	Model	BC-4	Model	DP-6
Serial #	N/A	Serial #	843	Serial #	662
Cal Due	N/A	Cal Due	10/4/05	Cal Due	3/3/05
Bkg	N/A cpmβ	Bkg	44.7 cpmβ	Bkg	650 cpmβ
Efficiency	N/A %	Efficiency	14.00 %	Efficiency	22.00 %
MDA	205 dpmβ	MDA	258 dpmβ	MDA	745 dpmβ

Survey Tracking # N/A

Survey Type: Contamination

Building: 990 and 990A

Location: Interior and Exterior Surfaces

Purpose: Pre-Demolition Verification Survey

RWP #: N/A

Date: 11/1/04 Time: 1050

RCT: J. Howard / [signature] / [redacted]

Print name Signature

RCT: F. Mojica / [signature] / [redacted]

Print name Signature Emp. #

COPY

PRN/REN # : N/A

Comments: Nuclides of concern are Uranium and Plutonium. Survey performed to verify contamination levels prior to demolition of B990. Performed swipe of floors, and walls in B990. Beta efficiencies listed reflect correction for Depleted Uranium (DU), calibrated efficiency for Electra # 1379 is 31.6% and for BC-4 # 843 is 25.0%.

	LOCATION	ALPHA Swipe	ALPHA Direct	ALPHA Wipe	BETA Swipe	BETA Direct	BETA Wipe
#		dpm/100cm2	dpm/100cm2	dpm/wipe	dpm/100cm2	dpm/100cm2	dpm/wipe
1-5	B990 floors	<20	N/A	<44	<200	N/A	<745
6-9	B990 interior walls	<20	N/A	<44	<200	N/A	<745
10-15	B990 external walls	<20	N/A	<44	<200	N/A	<745
16-19	B990 remaining equipment	<20	N/A	<44	<200	N/A	<745
20-24	B990A floors	<20	N/A	<44	<200	N/A	<745
25-30	B990A interior walls	<20	N/A	<44	<200	N/A	<745
31-36	B990A external walls	<20	N/A	<44	<200	N/A	<745
37-40	B990A remaining equipment	<20	N/A	<44	<200	N/A	<745
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Date Reviewed: 11/2/04 **RS Supervision:** G. S. Treadwell / [signature] [redacted]

Print Name Signature

ATTACHMENT D

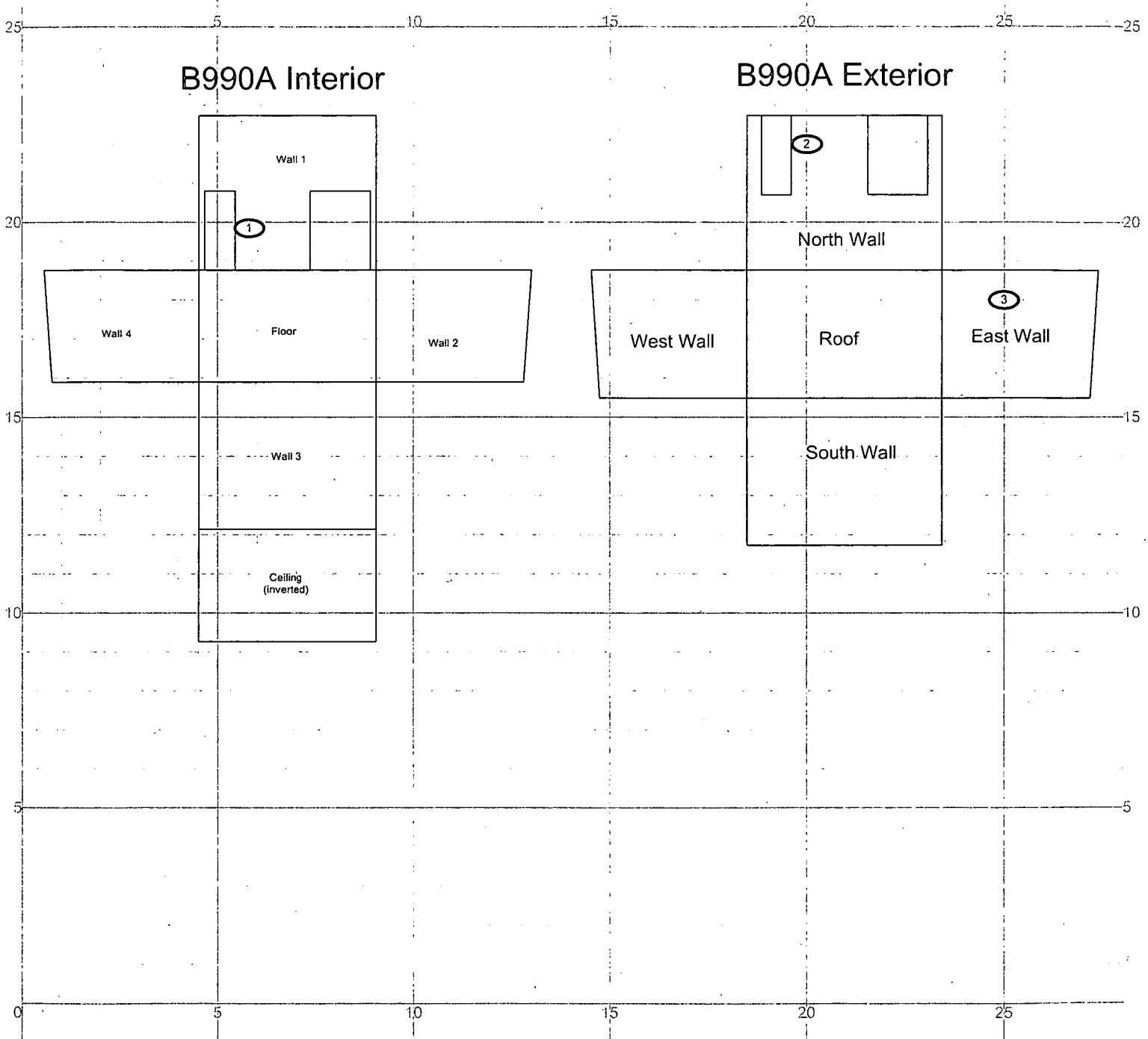
Chemical Data Summaries and Sample Maps

Asbestos Data Summary

Sample Number	Map Survey Location	Room	Material Sampled and Location	Analytical Results
Building 990A-RIN 03Z1881				
990A-06122003-315-201	1	Main	White paint on CMU, east wall	None Detected
990A-06122003-315-202	2	Exterior	Beige paint on CMU, east wall	None Detected
990A-06122003-315-203	3	Exterior	Beige paint on CMU, south wall	None Detected

CHEMICAL SAMPLE MAP

Building 990A Interior and Exterior
Asbestos



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

CH2MHILL
Communications Group

Prepared for: KAISER-HILL COMPANY

MAP ID: 03-0221/990A-ASB

July 7, 2003

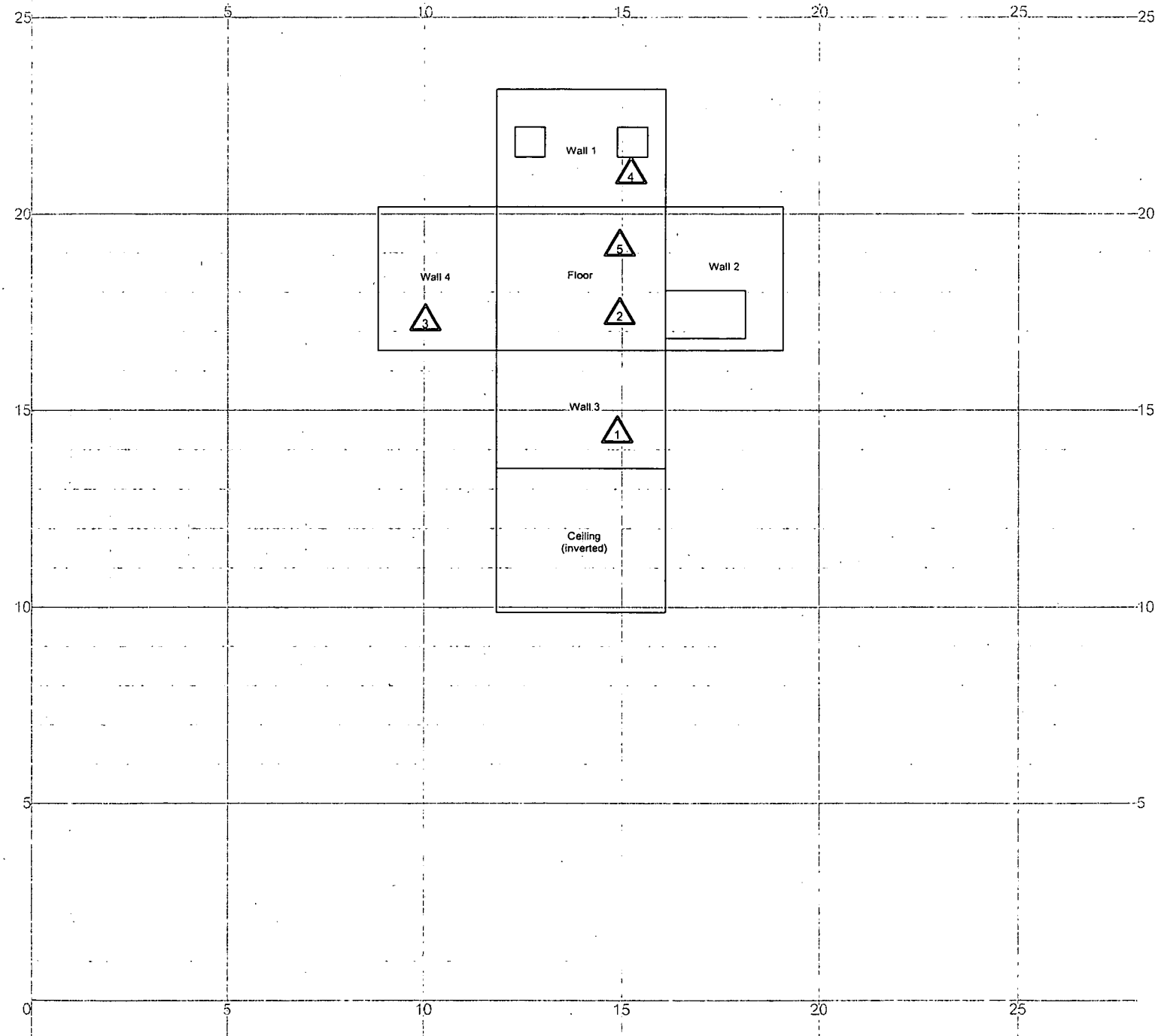
73

Beryllium Data Summary

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($ug/100\ cm^2$)
Building 990A-RIN 03Z1880				
990A-06122003-315-101	1	Main	Top of 480V common panel, north wall	< 0.1
990A-06122003-315-102	2	Main	On concrete floor	< 0.1
990A-06122003-315-103	3	Main	Top of metal storage cabinet	< 0.1
990A-06122003-315-104	4	Main	On inside of roll-up door	< 0.1
990A-06122003-315-105	5	Main	Top of blue metal storage cabinet	< 0.1
Building 990-RIN 03Z1880				
990-06122003-315-101	1	Main	Top of electrical panel, south wall	< 0.1
990-06122003-315-102	2	Main	Top of pump 336-060	< 0.1
990-06122003-315-103	3	Main	Top of metal sampling table/cabinet, west wall	< 0.1
990-06122003-315-104	4	Main	On window sill, north wall	< 0.1
990-06122003-315-105	5	Main	On metal base of sump pump 336-060	< 0.1

CHEMICAL SAMPLE MAP

Building 990 Interior
Beryllium



SURVEY MAP LEGEND

- (#) Asbestos Sample Location
- (#) Beryllium Sample Location
- [#] Lead Sample Location
- ◇# RCRA/CERCLA Sample Location
- (#) PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

CH2MHILL Communications Group

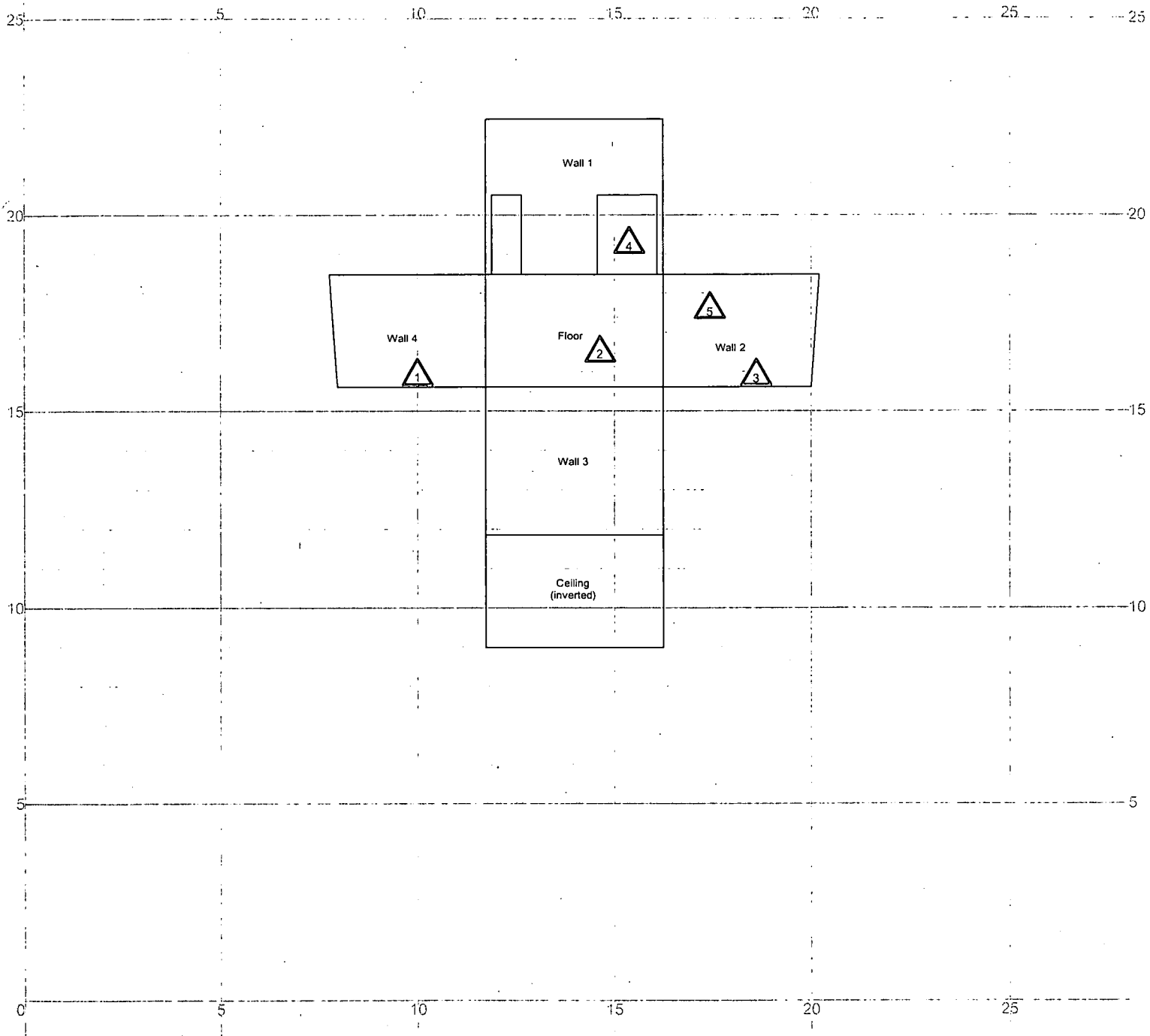
KAISER-HILL

MAP ID: 03-0221/990-BE July 3, 2003

75

CHEMICAL SAMPLE MAP

Building 990A Interior
Beryllium



SURVEY MAP LEGEND

- (#) Asbestos Sample Location
- (A) Beryllium Sample Location
- [#] Lead Sample Location
- ◇ RCRA/CERCLA Sample Location
- (#) PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

CH2MHILL Communications Group

Prepared for: KAISER-HILL

MAP ID: 03-0221/990A-BE

July 3, 2003

Omega Number	Customer Number	Unique Identifier
0411038-001A	AA83-142A	North Basin #1
0411038-002A	AA83-142B	North Basin #2
0411038-003A	AA83-142C	South Basin #1
0411038-004A	AA83-142D	South Basin #2

FINAL DATA

URS

Metals Analysis

COVER PAGE

PROJECT SAMPLE IDENTIFICATION CROSS-REFERENCE TO URS SAMPLE LABORATORY IDs

WorkOrder: 0411038

Subcontract 68FKH0225800

COC Number	Project Sample ID Number	Customer Number	Matrix	Date Received	URS Sample ID Number	Line Item Code
05F0006#001	05F0006-001.001	AA83-142A	SOIL	11/16/2004	0411038-001A	EME-A-001
05F0006#001	05F0006-002.001	AA83-142B	SOIL	11/16/2004	0411038-002A	EME-A-001
05F0006#001	05F0006-003.001	AA83-142C	SOIL	11/16/2004	0411038-003A	EME-A-001
05F0006#001	05F0006-004.001	AA83-142D	SOIL	11/16/2004	0411038-004A	EME-A-001

Certification Statement

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

Steven L. Baca — Signature

Thursday, November 18, 2004 10:20:25 — Date

Laboratory/Data Management Lead — Title

78

FINAL DATA

0411038

Sample Originator (Organization or Program/Project Name) URS ER	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # 05F0006#001 Page 1 of 1

Sampler(s) MATTSON, ERICK Parsons, Duane Signature: Date: 11/16/04	Contact/Requester KOCH, ERICA	Telephone No. (303) 994-4709
RIN 05F0006	Sampling Orgin 000-3 (Sewer System)	Purchase Order/Charge Code GR300410
Project Title ER Project	Logbook No. N/A	Ice Chest No. N/A Temp. N/A
To (Lab): URS	Method of Shipment HAND DELIVER	Bill of Lading/Air Bill No. N/A N/A
Protocol IASAP Addenda 2002	Related COC (if any) N/A	PRE CHAD BLAKE-01/22/02

POSSIBLE SAMPLE HAZARDS/REMARKS
Are acid-preserved samples DOT hazardous per 40 CFR Part136.3 Table II? YES or (NO)
Are other known hazardous substances present? YES or (NO)
None

SCREENING REQUIRED ☐ N/A

SPECIAL INSTRUCTIONS N/A

Bottle No.	Customer Number	Matrix	Date	Time	Location	Container (size/type/quantity)			Fil	Sample Analysis (LIC/(Method)/[TAT]/{Lab})	Preservative/ Packing
05F0006-001.001	AA83-142A	SOLID	11/16/2004	11:45	AA83-142	125	G	ML	N	EME-A-001(SW-846 6200)[24hrS]{URS}	None 4 C
05F0006-002.001	AA83-142B	SOLID	11/16/2004	11:46	AA83-142	125	G	ML	N	EME-A-001(SW-846 6200)[24hrS]{URS}	None 4 C
05F0006-003.001	AA83-142C	SOLID	11/16/2004	11:46	AA83-142	125	G	ML	N	EME-A-001(SW-846 6200)[24hrS]{URS}	None 4 C
05F0006-004.001	AA83-142D	SOLID	11/16/2004	11:46	AA83-142	125	G	ML	N	EME-A-001(SW-846 6200)[24hrS]{URS}	None 4 C

Relinquished By: / Date/Time:	Received By: / Date/Time:	Relinquished By: / Date/Time:	Received By: / Date/Time:
11/16/04 1145	URS 11-16-04 1145		

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., returned to customer, disposal per lab procedure, consumed during analysis):	Disposed By:	Date/Time:

FINAL DATA

URS

Executive Summary

Non-Radiological Detection Highlights - See Form I for Complete Analytical Suite

URS Work Order: 0411038

Parameter		Result	Qual	Reporting Limit	Units	LIC
05F0006-001.001	**AA83-142A**	**AA83-142**		**000-3**	**000-500**	**11/16/2004 11:45:53**
Antimony		23.3	B	35	mg/Kg-dry	EME-A-001
Arsenic		79		15	mg/Kg-dry	EME-A-001
Barium		1070		150	mg/Kg-dry	EME-A-001
Cadmium		10.1	B	85	mg/Kg-dry	EME-A-001
Calcium		20000		3000	mg/Kg-dry	EME-A-001
Chromium		270		90	mg/Kg-dry	EME-A-001
Cobalt		14.8	B	90	mg/Kg-dry	EME-A-001
Copper		2430		300	mg/Kg-dry	EME-A-001
Iron		59200		2500	mg/Kg-dry	EME-A-001
Lead		640		20	mg/Kg-dry	EME-A-001
Manganese		326		200	mg/Kg-dry	EME-A-001
Mercury		12.5	B	15	mg/Kg-dry	EME-A-001
Nickel		87.3		60	mg/Kg-dry	EME-A-001
Potassium		16100		2000	mg/Kg-dry	EME-A-001
Selenium		5.4	B	20	mg/Kg-dry	EME-A-001
Silver		391		55	mg/Kg-dry	EME-A-001
Strontium		252		250	mg/Kg-dry	EME-A-001
Tin		429		45	mg/Kg-dry	EME-A-001
Titanium		2940		500	mg/Kg-dry	EME-A-001
Vanadium		258		90	mg/Kg-dry	EME-A-001
Zinc		1490		50	mg/Kg-dry	EME-A-001
Percent Moisture		25.55		0	wt%	PMOIST

Qualifiers:

RL - Reporting Limit

DF - Dilution Factor

Organic

* - Surrogate values outside of control limits

B - Analyte detected in the associated Method Blank > RL

E - Exceeds GC/MS Calibration Range

H - Analysis Performed Outside of Holding Time

J - Estimated - Analyte detected below quantitation limits

ND - Not Detected at the Reporting Limit

U - Not Detected at the Reporting Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits

B - Value less than RL, but >= MDL

H - Analysis Performed Outside of Holding Time

M - Target RL Not Achieved via gamma spectroscopy

N - Spike Recovery outside accepted recovery limits

U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

80

FINAL DATA

URS Work Order: 0411038

Parameter		Result	Qual	Reporting Limit	Units	LIC
05F0006-002.001	AA83-142B	AA83-142		000-3	000-500	11/16/2004 11:46:16
Antimony		44		35	mg/Kg-dry	EME-A-001
Arsenic		109		15	mg/Kg-dry	EME-A-001
Barium		1080		150	mg/Kg-dry	EME-A-001
Cadmium		15.9	B	85	mg/Kg-dry	EME-A-001
Calcium		19700		3000	mg/Kg-dry	EME-A-001
Chromium		315		90	mg/Kg-dry	EME-A-001
Cobalt		13.1	B	90	mg/Kg-dry	EME-A-001
Copper		2690		300	mg/Kg-dry	EME-A-001
Iron		54100		2500	mg/Kg-dry	EME-A-001
Lead		1070		20	mg/Kg-dry	EME-A-001
Manganese		379		200	mg/Kg-dry	EME-A-001
Mercury		21.1		15	mg/Kg-dry	EME-A-001
Nickel		128		60	mg/Kg-dry	EME-A-001
Potassium		17900		2000	mg/Kg-dry	EME-A-001
Selenium		6.6	B	20	mg/Kg-dry	EME-A-001
Silver		344		55	mg/Kg-dry	EME-A-001
Strontium		244	B	250	mg/Kg-dry	EME-A-001
Tin		1280		45	mg/Kg-dry	EME-A-001
Titanium		3050		500	mg/Kg-dry	EME-A-001
Vanadium		341		90	mg/Kg-dry	EME-A-001
Zinc		2390		50	mg/Kg-dry	EME-A-001
Percent Moisture		24.28		0	wt%	PMOIST

Qualifiers:

RL - Reporting Limit

DF - Dilution Factor

Organic

* - Surrogate values outside of control limits

B - Analyte detected in the associated Method Blank > RL

E - Exceeds GC/MS Calibration Range

H - Analysis Performed Outside of Holding Time

J - Estimated - Analyte detected below quantitation limits

ND - Not Detected at the Reporting Limit

U - Not Detected at the Reporting Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits

B - Value less than RL, but >= MDL

H - Analysis Performed Outside of Holding Time

M - Target RL Not Achieved via gamma spectroscopy

N - Spike Recovery outside accepted recovery limits

U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

81

FINAL DATA

URS Work Order: 0411038

Parameter		Result	Qual	Reporting Limit	Units	LIC
05F0006-003.001	**AA83-142C**	**AA83-142**		**000-3**	**000-500**	**11/16/2004 11:46:22**
Arsenic		17.8		15	mg/Kg-dry	EME-A-001
Barium		1240		150	mg/Kg-dry	EME-A-001
Cadmium		12.5	B	85	mg/Kg-dry	EME-A-001
Calcium		64900		3000	mg/Kg-dry	EME-A-001
Chromium		155		90	mg/Kg-dry	EME-A-001
Cobalt		14.7	B	90	mg/Kg-dry	EME-A-001
Copper		1360		300	mg/Kg-dry	EME-A-001
Iron		62700		2500	mg/Kg-dry	EME-A-001
Lead		433		20	mg/Kg-dry	EME-A-001
Manganese		422		200	mg/Kg-dry	EME-A-001
Mercury		21.8		15	mg/Kg-dry	EME-A-001
Nickel		87.9		60	mg/Kg-dry	EME-A-001
Potassium		14600		2000	mg/Kg-dry	EME-A-001
Selenium		4.26	B	20	mg/Kg-dry	EME-A-001
Silver		200		55	mg/Kg-dry	EME-A-001
Strontium		394		250	mg/Kg-dry	EME-A-001
Tin		192		45	mg/Kg-dry	EME-A-001
Titanium		2690		500	mg/Kg-dry	EME-A-001
Vanadium		105		90	mg/Kg-dry	EME-A-001
Zinc		3810		50	mg/Kg-dry	EME-A-001
Percent Moisture		35.14		0	wt%	PMOIST
05F0006-004.001	**AA83-142D**	**AA83-142**		**000-3**	**000-500**	**11/16/2004 11:46:27**
Arsenic		18.9		15	mg/Kg-dry	EME-A-001
Barium		1220		150	mg/Kg-dry	EME-A-001
Calcium		66600		3000	mg/Kg-dry	EME-A-001
Chromium		150		90	mg/Kg-dry	EME-A-001
Cobalt		12.1	B	90	mg/Kg-dry	EME-A-001
Copper		1060		300	mg/Kg-dry	EME-A-001
Iron		56100		2500	mg/Kg-dry	EME-A-001
Lead		235		20	mg/Kg-dry	EME-A-001
Manganese		401		200	mg/Kg-dry	EME-A-001
Mercury		16.4		15	mg/Kg-dry	EME-A-001
Nickel		72.9		60	mg/Kg-dry	EME-A-001
Potassium		15200		2000	mg/Kg-dry	EME-A-001
Selenium		2.34	B	20	mg/Kg-dry	EME-A-001
Silver		168		55	mg/Kg-dry	EME-A-001
Strontium		418		250	mg/Kg-dry	EME-A-001
Tin		131		45	mg/Kg-dry	EME-A-001
Titanium		2470		500	mg/Kg-dry	EME-A-001
Vanadium		102		90	mg/Kg-dry	EME-A-001
Zinc		2890		50	mg/Kg-dry	EME-A-001
Percent Moisture		37.79		0	wt%	PMOIST

Qualifiers:

RL - Reporting Limit

DF - Dilution Factor

Organic

* - Surrogate values outside of control limits

B - Analyte detected in the associated Method Blank > RL

E - Exceeds GC/MS Calibration Range

H - Analysis Performed Outside of Holding Time

J - Estimated - Analyte detected below quantitation limits

ND - Not Detected at the Reporting Limit

U - Not Detected at the Reporting Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits

B - Value less than RL, but >= MDL

H - Analysis Performed Outside of Holding Time

M - Target RL Not Achieved via gamma spectroscopy

N - Spike Recovery outside accepted recovery limits

U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

82

FINAL DATA

FORM 605-3b METHOD 6200 CASE NARRATIVE

Run ID: XRF_041117A Analysis Date: 11/17/04

Preparation Comments:	No problems with sample preparation. Samples were prepared per URS LSOP 304 (latest revision). Small metal shavings were sieved out during the processing of all four of these samples; these were screened and found not radioactive.
Analysis Comments:	1. ICAL dated 8/03/04
2. Method Blank: No compounds were detected with the exception of copper, iron, manganese, potassium, silver, strontium and titanium.	
3. LCS: All monitored LCS metals in NIST Standard 8704 are reported within acceptable QC limits.	
4. First Sample Duplicate (%D): All compounds are reported within acceptable QC limits.	
5. Mid Run CCV: Not required for runs less than 10 samples.	
6. Ending CCV: All compounds are reported within acceptable QC limits with the exception of barium (146%).	
7. Last Sample Replicate (RPD): All compounds are reported within acceptable QC limits.	
8. Stability Test: Performed 11/09/04 – Instrument Contribution less than 0.20% RSD for total counts, less than 0.23% RSD for peak counts – Passed.	
9. Resolution Test: Performed 11/10/04 – Final average resolution value less than 195 eV – Passed.	
10. Comments: Lead and Molybdenum method detection limits exceed GR04.A4 of 20 and 50 mg/kg, respectively. Relief has been granted per Kaiser-Hill. Bracketed values in the raw data indicate a non-statistically valid number below the MDL.	

Analyst: Heather Tine for Stanley Gladych Date: 11/17/04

Technical Reviewer: Steve Baca Date: 11/17/04

FINAL DATA

URS

Date: 18-Nov-04

Client: Rocky Flats Environmental Restoration Group
Client Sample ID: AA83-142A
Lab Order: 0411038
Location: AA83-142
Lab ID: 0411038-001A
Bottle Number: 05F0006-001.001
Project: 000-3
Collection Date: 11/16/2004 11:45:53
Central Ave/Sanitary Sewer/B771 Old Outfall
Matrix: SOIL

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
METALS BY X-RAY FLUORESCENCE	Percent Moisture = 25.55						Analyst: **SHG**
Instrument ID: XRF	Analytical Run: XRF_041117A		Run No: 3865				**SW6200**
Antimony	23	35.0	11	B	mg/Kg-dry	1	11/17/2004 16:50
Arsenic	79.0	15.0	10		mg/Kg-dry	1	11/17/2004 16:50
Barium	1070	150	150		mg/Kg-dry	1	11/17/2004 16:50
Cadmium	10	85.0	8	B	mg/Kg-dry	1	11/17/2004 16:50
Calcium	20000	3000	1560		mg/Kg-dry	1	11/17/2004 16:50
Chromium	270	90.0	21		mg/Kg-dry	1	11/17/2004 16:50
Cobalt	15	90.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Copper	2430	300	13		mg/Kg-dry	1	11/17/2004 16:50
Iron	59200	2500	391		mg/Kg-dry	1	11/17/2004 16:50
Lead	640	20.0	69		mg/Kg-dry	1	11/17/2004 16:50
Manganese	326	200	40		mg/Kg-dry	1	11/17/2004 16:50
Mercury	13	15.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Molybdenum	ND	50.0	100		mg/Kg-dry	1	11/17/2004 16:50
Nickel	87.3	60.0	3		mg/Kg-dry	1	11/17/2004 16:50
Potassium	16100	2000	477		mg/Kg-dry	1	11/17/2004 16:50
Selenium	5.4	20.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Silver	391	55.0	2		mg/Kg-dry	1	11/17/2004 16:50
Strontium	252	250	7		mg/Kg-dry	1	11/17/2004 16:50
Tin	429	45.0	10		mg/Kg-dry	1	11/17/2004 16:50
Titanium	2940	500	106		mg/Kg-dry	1	11/17/2004 16:50
Vanadium	258	90.0	33		mg/Kg-dry	1	11/17/2004 16:50
Zinc	1490	50.0	27		mg/Kg-dry	1	11/17/2004 16:50
PERCENT MOISTURE							Analyst: **SHG**
Instrument ID: Oven1	Analytical Run: OVEN1_041116A		Run No: 3859				**D2216**
Percent Moisture	25.55		0.1		wt%	1	11/17/2004 08:30

Qualifiers:

RL - Reporting Limit
DF - Dilution Factor

Analyte Name Suffixes:
m - Metastable

Organic

* - Surrogate values outside of control limits
B - Analyte detected in associated Method Blank > MDL
E - Exceeds GC/MS Calibration Range
H - Analysis Performed Outside of Holding Time
J - Estimated - Analyte detected below quantitation limits
ND - Not Detected at the Reporting Limit
U - Not Detected at the Reporting Limit
R - RPD exceeds the Control Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits
B - Value less than RL, but >= MDL
H - Analysis Performed Outside of Holding Time
M - Target RL Not Achieved via gamma spectroscopy
N - Spike Recovery outside accepted recovery limits
U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

84

FINAL DATA

URS

Date: 18-Nov-04

Client:	Rocky Flats Environmental Restoration Group	**Client Sample ID:**	AA83-142B
Lab Order:	0411038	**Location:**	AA83-142
Lab ID:	0411038-002A	**Bottle Number:**	05F0006-002.001
Project:	000-3	**Collection Date:**	11/16/2004 11:46:16
	Central Ave/Sanitary Sewer/B771 Old Outfall	**Matrix:**	SOIL

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
METALS BY X-RAY FLUORESCENCE	Percent Moisture = 24.28						Analyst: **SHG**
Instrument ID: XRF	Analytical Run: XRF_041117A		Run No: 3865				**SW6200**
Antimony	44.0	35.0	11		mg/Kg-dry	1	11/17/2004 16:50
Arsenic	109	15.0	10		mg/Kg-dry	1	11/17/2004 16:50
Barium	1080	150	150		mg/Kg-dry	1	11/17/2004 16:50
Cadmium	16	85.0	8	B	mg/Kg-dry	1	11/17/2004 16:50
Calcium	19700	3000	1560		mg/Kg-dry	1	11/17/2004 16:50
Chromium	315	90.0	21		mg/Kg-dry	1	11/17/2004 16:50
Cobalt	13	90.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Copper	2690	300	13		mg/Kg-dry	1	11/17/2004 16:50
Iron	54100	2500	391		mg/Kg-dry	1	11/17/2004 16:50
Lead	1070	20.0	69		mg/Kg-dry	1	11/17/2004 16:50
Manganese	379	200	40		mg/Kg-dry	1	11/17/2004 16:50
Mercury	21.1'	15.0	1		mg/Kg-dry	1	11/17/2004 16:50
Molybdenum	ND	50.0	100		mg/Kg-dry	1	11/17/2004 16:50
Nickel	128	60.0	3		mg/Kg-dry	1	11/17/2004 16:50
Potassium	17900	2000	477		mg/Kg-dry	1	11/17/2004 16:50
Selenium	6.6	20.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Silver	344	55.0	2		mg/Kg-dry	1	11/17/2004 16:50
Strontium	240	250	7	B	mg/Kg-dry	1	11/17/2004 16:50
Tin	1280	45.0	10		mg/Kg-dry	1	11/17/2004 16:50
Titanium	3050	500	106		mg/Kg-dry	1	11/17/2004 16:50
Vanadium	341	90.0	33		mg/Kg-dry	1	11/17/2004 16:50
Zinc	2390	50.0	27		mg/Kg-dry	1	11/17/2004 16:50
PERCENT MOISTURE							Analyst: **SHG**
Instrument ID: Oven1	Analytical Run: OVEN1_041116A		Run No: 3859				**D2216**
Percent Moisture	24.28		0.1		wt%	1	11/17/2004 08:30

Qualifiers:

RL - Reporting Limit
DF - Dilution Factor

Analyte Name Suffixes:
m - Metastable

Organic

* - Surrogate values outside of control limits
B - Analyte detected in associated Method Blank > MDL
E - Exceeds GC/MS Calibration Range
H - Analysis Performed Outside of Holding Time
J - Estimated - Analyte detected below quantitation limits
ND - Not Detected at the Reporting Limit
U - Not Detected at the Reporting Limit
R - RPD exceeds the Control Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits
B - Value less than RL, but >= MDL
H - Analysis Performed Outside of Holding Time
M - Target RL Not Achieved via gamma spectroscopy
N - Spike Recovery outside accepted recovery limits
U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

85

FINAL DATA

URS

Date: 18-Nov-04

Client: Rocky Flats Environmental Restoration Group
Client Sample ID: AA83-142C
Lab Order: 0411038
Location: AA83-142
Lab ID: 0411038-003A
Bottle Number: 05F0006-003.001
Project: 000-3
Collection Date: 11/16/2004 11:46:22
Central Ave/Sanitary Sewer/B771 Old Outfall
Matrix: SOIL

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
METALS BY X-RAY FLUORESCENCE	Percent Moisture = 35.14						Analyst: **SHG**
Instrument ID: XRF	Analytical Run: XRF_041117A		Run No: 3865				**SW6200**
Antimony	ND	35.0	11		mg/Kg-dry	1	11/17/2004 16:50
Arsenic	17.8	15.0	10		mg/Kg-dry	1	11/17/2004 16:50
Barium	1240	150	150		mg/Kg-dry	1	11/17/2004 16:50
Cadmium	13	85.0	8	B	mg/Kg-dry	1	11/17/2004 16:50
Calcium	64900	3000	1560		mg/Kg-dry	1	11/17/2004 16:50
Chromium	155	90.0	21		mg/Kg-dry	1	11/17/2004 16:50
Cobalt	15	90.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Copper	1360	300	13		mg/Kg-dry	1	11/17/2004 16:50
Iron	62700	2500	391		mg/Kg-dry	1	11/17/2004 16:50
Lead	433	20.0	69		mg/Kg-dry	1	11/17/2004 16:50
Manganese	422	200	40		mg/Kg-dry	1	11/17/2004 16:50
Mercury	21.8	15.0	1		mg/Kg-dry	1	11/17/2004 16:50
Molybdenum	ND	50.0	100		mg/Kg-dry	1	11/17/2004 16:50
Nickel	87.9	60.0	3		mg/Kg-dry	1	11/17/2004 16:50
Potassium	14600	2000	477		mg/Kg-dry	1	11/17/2004 16:50
Selenium	4.3	20.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Silver	200	55.0	2		mg/Kg-dry	1	11/17/2004 16:50
Strontium	394	250	7		mg/Kg-dry	1	11/17/2004 16:50
Tin	192	45.0	10		mg/Kg-dry	1	11/17/2004 16:50
Titanium	2690	500	106		mg/Kg-dry	1	11/17/2004 16:50
Vanadium	105	90.0	33		mg/Kg-dry	1	11/17/2004 16:50
Zinc	3810	50.0	27		mg/Kg-dry	1	11/17/2004 16:50
PERCENT MOISTURE							Analyst: **SHG**
Instrument ID: Oven1	Analytical Run: OVEN1_041116A		Run No: 3859				**D2216**
Percent Moisture	35.14		0.1		wt%	1	11/17/2004 08:30

Qualifiers:

RL - Reporting Limit
DF - Dilution Factor

Analyte Name Suffixes:

m - Metastable

Organic

* - Surrogate values outside of control limits
B - Analyte detected in associated Method Blank > MDL
E - Exceeds GC/MS Calibration Range
H - Analysis Performed Outside of Holding Time
J - Estimated - Analyte detected below quantitation limits
ND - Not Detected at the Reporting Limit
U - Not Detected at the Reporting Limit
R - RPD exceeds the Control Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits
B - Value less than RL, but >= MDL
H - Analysis Performed Outside of Holding Time
M - Target RL Not Achieved via gamma spectroscopy
N - Spike Recovery outside accepted recovery limits
U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

86

FINAL DATA

URS

Date: 18-Nov-04

Client:	Rocky Flats Environmental Restoration Group	**Client Sample ID:**	AA83-142D
Lab Order:	0411038	**Location:**	AA83-142
Lab ID:	0411038-004A	**Bottle Number:**	05F0006-004.001
Project:	000-3	**Collection Date:**	11/16/2004 11:46:27
	Central Ave/Sanitary Sewer/B771 Old Outfall	**Matrix:**	SOIL

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
METALS BY X-RAY FLUORESCENCE	Percent Moisture = 37.79						Analyst: **SHG**
Instrument ID: XRF	Analytical Run: XRF_041117A		Run No: 3865				**SW6200**
Antimony	ND	35.0	11		mg/Kg-dry	1	11/17/2004 16:50
Arsenic	18.9	15.0	10		mg/Kg-dry	1	11/17/2004 16:50
Barium	1220	150	150		mg/Kg-dry	1	11/17/2004 16:50
Cadmium	ND	85.0	8		mg/Kg-dry	1	11/17/2004 16:50
Calcium	66600	3000	1560		mg/Kg-dry	1	11/17/2004 16:50
Chromium	150	90.0	21		mg/Kg-dry	1	11/17/2004 16:50
Cobalt	12	90.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Copper	1060	300	13		mg/Kg-dry	1	11/17/2004 16:50
Iron	56100	2500	391		mg/Kg-dry	1	11/17/2004 16:50
Lead	235	20.0	69		mg/Kg-dry	1	11/17/2004 16:50
Manganese	401	200	40		mg/Kg-dry	1	11/17/2004 16:50
Mercury	16.4	15.0	1		mg/Kg-dry	1	11/17/2004 16:50
Molybdenum	ND	50.0	100		mg/Kg-dry	1	11/17/2004 16:50
Nickel	72.9	60.0	3		mg/Kg-dry	1	11/17/2004 16:50
Potassium	15200	2000	477		mg/Kg-dry	1	11/17/2004 16:50
Selenium	2.3	20.0	1	B	mg/Kg-dry	1	11/17/2004 16:50
Silver	168	55.0	2		mg/Kg-dry	1	11/17/2004 16:50
Strontium	418	250	7		mg/Kg-dry	1	11/17/2004 16:50
Tin	131	45.0	10		mg/Kg-dry	1	11/17/2004 16:50
Titanium	2470	500	106		mg/Kg-dry	1	11/17/2004 16:50
Vanadium	102	90.0	33		mg/Kg-dry	1	11/17/2004 16:50
Zinc	2890	50.0	27		mg/Kg-dry	1	11/17/2004 16:50
PERCENT MOISTURE							Analyst: **SHG**
Instrument ID: Oven1	Analytical Run: OVEN1_041116A		Run No: 3859				**D2216**
Percent Moisture	37.79		0.1		wt%	1	11/17/2004 08:30

Qualifiers:

RL - Reporting Limit

DF - Dilution Factor

Analyte Name Suffixes:

m - Metastable

Organic

* - Surrogate values outside of control limits

B - Analyte detected in associated Method Blank > MDL

E - Exceeds GC/MS Calibration Range

H - Analysis Performed Outside of Holding Time

J - Estimated - Analyte detected below quantitation limits

ND - Not Detected at the Reporting Limit

U - Not Detected at the Reporting Limit

R - RPD exceeds the Control Limit

Inorganic/Gamma Spectroscopy

* - Duplicate analysis outside of control limits

B - Value less than RL, but >= MDL

H - Analysis Performed Outside of Holding Time

M - Target RL Not Achieved via gamma spectroscopy

N - Spike Recovery outside accepted recovery limits

U - Analyzed but not detected/Not detected above MDA via gamma spectroscopy

87

ATTACHMENT E

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically asbestos and beryllium.)

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, asbestos in Table E-2 and beryllium in Table E-3. A data completeness summary for all results is given in Table E-4.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of Regulator approval. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for Buildings 990 (including aeration tanks and manhole) and 990A based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. Elevated net activity on one interior sample location had a coupon sample taken and analyzed by ISOCS Canberra gamma spectroscopy. No transuranic isotope activity was detected; elevated activity was determined to be uranium and/or other naturally occurring isotope activity. The coupon sample result was evaluated against, and was less than the uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limit. Consequently, all survey results were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2) and the Uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design was optimized by checking actual measurement results (acquired during pre-demolition surveys) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All surveys yielded results less than their associated action levels and with acceptable uncertainties, except the below anomalous conditions:

89

- Initial sample net activity was identified at location 13 (111.3 dpm/100cm^2) in survey unit 990005 that was greater than the Transuranic DCGL$_w$ (100 dpm/100cm^2). A concrete surface sample was collected at location 13 and analyzed by Canberra ISOCS gamma spectroscopy. No transuranic activity was detected. The sample activity was determined to be from uranium and/or naturally occurring isotopes. The gamma spectroscopy result was below the Uranium DCGL$_w$ (5,000 dpm/100cm^2). All survey results are less than the applicable DCGLs, therefore, no further investigation is required. On this basis, the Transuranic net activity value (prior to background subtraction) for location 13 was reported as zero (0.0), therefore, the net activity value (after background subtraction) was reported as –14.2 dpm/100cm^2 in the TSA Data Summary.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied MARSSIM guidance. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits ensuring data result accuracy. All facility contamination levels were below applicable unrestricted release levels confirming a Type 1 Facility classification for Buildings 990 (including aeration tanks and manhole) and 990A.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facilities. On this basis Buildings 990 (including aeration tanks and manhole) and 990A meet the unrestricted release criteria with the confidences stated herein.

Table E-1 V&V of Radiological Results - Buildings 990 (including aeration tanks and manhole) and 990A

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
	QUALITY REQUIREMENTS			
	Parameters	Measure	frequency	COMMENTS
ACCURACY	initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥ 1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	field duplicate measurements for TSA	≥ 5% of real survey points	≥ 10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units 990004, 990005 and 990006 (interior and exterior).	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	Qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	See Table E-4 for details.
SENSITIVITY	detection limits	TSA: ≤50 dpm/100cm^2 RA: ≤10 dpm/100cm^2	all measures	MDAs ≤ 50% DCGL$_w$ per MARSSIM guidelines.

Table E-2 V&V of Asbestos Results - Buildings 990 (including aeration tanks and manhole) and 990A

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
ASBESTOS	METHOD: EPA 600/R-93/116	LAB ---->	Reservoirs Environmental, Inc.; Denver, Co.	
QUALITY REQUIREMENT		RIN ---->	RIN03Z1881	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial/continuing	below detectable amounts	≥1	Semi-quantitative, per (microscopic) visual estimation.
PRECISION	Actual Number Sampled LCSD Lab duplicates	all below detectable amounts	≥ 3 samples	Semi-quantitative, per (microscopic) visual estimation.
REPRESENTATIVENESS	COC	Qualitative	NA	Chain-of-Custody intact: completed paperwork, containers w/ custody seals.
	Hold times/preservation	Qualitative	NA	N/A
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	See original Chemical Characterization Package (planning document); for field/sampling procedures (located in project file;) thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Measurement Units	% by bulk volume	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	Qualitative	NA	Final number of samples at Certified Inspector's discretion, See Table E-4.
SENSITIVITY	Detection limits	<1% by volume	All measures	N/A

Table E-3 V&V of Beryllium Results - Buildings 990 (including aeration tanks and manhole) and 990A

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	**Prep: NMAM 7300** **METHOD: OSHA ID-125G**	**LAB ---->**	Reservoirs Environmental Inc.	
QUALITY REQUIREMENTS		**RIN ---->**	RIN03Z1880	
		Measure	**Frequency**	**COMMENTS**
ACCURACY	**Calibrations** Initial	linear calibration	≥1	No qualifications significant enough to change project decisions, i.e., classification of Type 1 facilities confirmed. All results were below associated action levels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	MDL of 0.012 ug/100cm^2	all measures	

Table E-4 Data Completeness Summary - Buildings 990 (including aeration tanks and manhole) and 990A

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Asbestos	Building 990A (interior)	3 biased (interior)	3 biased (1 interior/2 exterior)	No ACM present, all results < 1% by volume	40 CFR763.86; CCR 1001-10; EPA 600/R-93/116 RIN03Z1881
Beryllium	Building 990 (interior)	5 biased (interior)	5 biased (interior)	No contamination found, all results are less than associated action levels	OSHA ID-125G RIN03Z1880 No results above action level (0.2ug/100cm^2) or investigative level (0.1 ug/100cm^2).
Beryllium	Building 990A (interior)	5 biased (interior)	5 biased (interior)	No contamination found, all results are less than associated action levels	OSHA ID-125G RIN03Z1880 No results above action level (0.2ug/100cm^2) or investigative level (0.1 ug/100cm^2).
Radiological	Survey Area 5 Survey Unit: 990004 Building 990 (interior and exterior)	20 α TSA (15 random and 5 biased) and 20 α Smears (15 random and 5 biased) 5 α TSA and 5 α Smears (equipment) 2 QC TSA 5% scan of interior and exterior surfaces	20 α TSA (15 random and 5 biased) and 20 α Smears (15 random and 5 biased) 5 α TSA and 5 α Smears (equipment) 2 QC TSA 5% scan of interior and exterior surfaces	No contamination at any location; all values below PDS unrestricted release levels	Transuranic DCGLs used.

Table E-4 Data Completeness Summary - Buildings 990 (including aeration tanks and manhole) and 990A

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 5 Survey Unit: 990005 Building 990A (interior and exterior)	20 α TSA (15 random and 5 biased) and 20 α Smears (15 random and 5 biased) 5 α TSA and 5 α Smears (equipment) 2 QC TSA 5% scan of interior and exterior surfaces	21 α TSA (15 random and 6 biased) and 21 α Smears (15 random and 6 biased) 5 α TSA and 5 α Smears (equipment) 2 QC TSA 5% scan of interior and exterior surfaces	No contamination at any location; all values below PDS unrestricted release levels	Transuranic and/or Uranium DCGLs used, as applicable. Initial sample net activity was greater than the Transuranic $DCGL_w$ (100 dpm/100cm^2) at location 13 (111.3 dpm/100cm^2). A concrete surface sample was collected at location 13 and analyzed by Canberra ISOCS gamma spectroscopy. No transuranic activity was detected. The sample activity was determined to be from uranium and/or naturally occurring isotopes. The gamma spectroscopy results were below the Uranium $DCGL_w$ (5000 dpm/100cm^2). All survey results are less than the applicable DCGLs, therefore, no further investigation is required. On this basis, the Transuranic net activity value (prior to background subtraction) for location 13 was reported as zero (0.0), therefore, the net activity value (after background subtraction) was reported as –14.2 dpm/100cm^2 in the TSA Data Summary.
Radiological	Survey Area 5 Survey Unit: 990006 Building 990 Aeration Tank Area (interior and exterior)	15 α TSA (random) and 15 α Smears (random) 2 QC TSA 5% scan of interior and exterior surfaces	15 α TSA (random) and 15 α Smears (random) 2 QC TSA 5% scan of interior and exterior surfaces	No contamination at any location; all values below PDS unrestricted release levels	Transuranic DCGLs used.